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Going for a song and dance: Olga Wojtas reports on the bizarre background to the sale of **CRAIGLOCKHART COLLEGE**, the former Roman Catholic teacher training centre in Edinburgh (page 10)

Patricia Santinelli looks at the two year pilot **COLLEGE EMPLOYERS LINKS** project involving eight local authorities and its attempts to foster better education/business cooperation (page 10)

Sandra Miller talks to Dr Michael Kauffmann, the superannuated museum official "who is to be director of the **COURTAULD Institute of Art**" (page 11)



Nazi racism was the direct cause of some of the worst atrocities ever perpetrated, in war or peace. But how far was **EUGENIC RESEARCH** an integral part of National Socialism and to what extent was it an autonomous and well-intentioned science. Paul Weindling uncovers the development of eugenics in pre-Nazi Germany and its subsequent political history (page 13)

Opinion still differs on the precise impact of agricultural **ENCLOSURE** on the rural poor. However, the received doctrine of the 1980s - that enclosure was no more than an episode in a long, inevitable pattern of decline - is now being challenged, both theoretically and quantitatively using Poor Law statistics. Eric J. Evans reviews K. D. M. Snell's study of agrarian England, *Annals of the Labouring Poor* (page 18)

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Yellow card on quality

Sir Keith Joseph, the Secretary of State for Education and Science, chose last week's conference on the Green Paper organized by the Society for Research into Higher Education and *The THES* to show universities the yellow card on academic standards. "More needs to be done - and can be done - to provide public reassurance about teaching and examination standards and develop programmes of staff appraisal and development," he declared.

The Secretary of State said that he would be asking the universities "with increasing frequency" to demonstrate to him that they were preserving standards; that he was still not convinced the universities were conscious enough of their responsibility for standards; and that he was disturbed that "only in the past two or three years" had universities begun to pay serious attention to these questions. He did not actually get out the red card, the Leverhulme recommendation for an external academic standards authority on the pattern of the Council for National Academic Awards, but clearly his fingers were clutching it in his pocket. Next time it will not be a warning but a sending-off, that was the tone, presumably deliberate, of Sir Keith's speech.

No clearer signal could have been given by Sir Keith that he is in the business of concentrating rather than dispersing centralized political power in this area. Quality and standards are too useful as political themes to be weakly surrendered to the care of those who actually know about such things.

Yet Sir Keith's outburst against the universities on standards last week was too strongly worded to be explained simply in terms of his general ambition to expand the power of the state over the scrutiny of academic quality in higher education. Nor can the obvious edge of irritation in his speech be explained by any general worry that university standards have been slipping; a direct result of the 1981 reduction in university places at a time of high demand has been to raise

standards, maybe too high. When the Secretary of State referred to the need for public reassurance he was clearly using "the public c'est moi" mode.

It is not even clear that Sir Keith himself is seriously concerned about university standards. If he were, the suggestion in the Green Paper that maybe arts subjects should be confined at degree level to universities because only they can deliver the necessary rigour in these disciplines, and the justification for his decision that the first tranche of the extra "switch" money should go only to universities on rather similar grounds would appear illogical and unfathomable. So what have universities done to provoke the Secretary of State's harsh tongue?

The above-the-board answer is that the Reynolds committee set up by the vice chancellors' committee to examine academic standards in universities has been too little and too late. But that seems an unfairly premature verdict when the work of the committee is still not complete, whatever view may have been taken of its preliminary reports. Although it began slowly Reynolds seems likely to produce a highly useful cumulative package of views and guidelines on academic standards.

The more cynical answer is that Sir Keith is very annoyed with the universities because they have criticized his Green Paper with wounding effect; his harsh remarks on standards are a warning to them to adopt a more constructive attitude to the DES's beleaguered policy on higher education. There is certainly an extraordinary rawness within the DES about the reception given to the Green Paper. In the text of Sir Keith's speech last week there was a sentence, which in his delivery he skipped, that exposed this rawness and irritation. In it the Secretary of State argued that doubt must be cast on the competence of those who indulged in unreasonable criticism of the Green Paper, an argument more familiar perhaps in countries a few hundred miles east of here.

According to ministers those who

criticize the Green Paper immoderately are simply not facing facts, and those who refuse to face facts are not competent to manage higher education (or comment on it?). The universities seem to have fallen victim to this curious logic. Their hostility to the Government having cast doubt on their general competence, their guardianship of academic standards immediately becomes suspect.

The sadness of Sir Keith's threatening intervention in the debate about how best to preserve high academic standards in universities lies not so much in its unfairness or ignorance.

It lies instead in the way in which his remarks have politicized the question of academic standards in universities quite unnecessarily. They have made genuine improvement more not less difficult to achieve. Such improvement is necessary. Although there is no public disquiet about university standards, universities do not do everything right. They tend to downgrade the professional skills of teaching and are reluctant to listen to student grievances on assessment. They show insufficient flexibility in adapting their courses to satisfy changing student fashions. They rely too much on the inevitably mythical "gold standard" on degrees and worry too little about comparability. They do not absorb and spread good practice as readily as they might. But all these issues have been receiving the quiet but firm attention of the Reynolds committee.

In any case such blemishes must be seen in the larger context of general satisfaction. By international standards British universities - and polytechnics and colleges too of course - like the highest pastoral and pedagogical care for their students. The Lindsay committee made it plain that in the end the only proper guarantee of high academic standards lies in the integrity and professionalism of the academic community. There is no evidence of any general failure of integrity or professionalism in our universities. If that appears like "incompetent" complacency to the DES, so be it.

contribute its skills and knowledge to a justifiable defence of the nation.

Opponents of this view will warn of the danger of higher education being sucked into some military-security apparatus, or similarly menacing abstraction. If it accepts the MOD's money. They will argue that the only result would be to produce "secret" departments and research teams within universities. The first seems a curiously negative attitude to adopt to the necessary defence of one's country. As for the second the position would at least be an improvement on the present situation. It is surely better to have those issues of morality and secrecy that inevitably accompany military research exposed to a wider debate within the academic community rather than being locked away in obscurity behind the security fence.

The loans stalemate

Like the Green Paper the Department of Education and Science's promised consultative paper on student support seems to have fallen victim to delay. Once promised before the beginning of Parliament's summer recess, it now seems possible that the paper may be delayed until the end of the present session which points to publication in September.

This review was promised at the end of last year when Sir Keith Joseph was forced by backbench pressure to abandon his plan to charge students from rich families for their tuition. That particular way forward having been blocked, it was hoped the review would be able to find another route out of the deceiving jungle of student support. Sir Keith instinctively seized again on his old favourite, student

the idea would take off.

This does not seem to have happened. Instead the informal word is that loans are off the political agenda - and for the foreseeable future - even if the presentation of the consultative paper fudges this decisive outcome of the review. The Treasury is still the obstacle, remains fearful that the short and maybe medium-term result of loans would be to increase that proportion of the nation's resources, only thinly privatized, devoted to student support.

The American and Swedish experiences certainly suggest that, because of the level of defaults and the need to protect graduates in low-pay professions, some public guarantee or subsidy is essential; the banks simply will not take student loans as an entire

students who at present receive discretionary awards or no grant at all and those whose parents are expected to make a substantial contribution would demand a fair share of loans. Neither factor, the demand for public guarantee and the expansionary pressure, makes much sense in a world of cash-limited public expenditure.

Yet the opponents of loans will have little cause to celebrate the indecisiveness of the present review. For what will happen will be an intensification of an indefensible status quo, the steady attrition of the student grant accompanied by the inequitable growth of an unofficial loans scheme, in the form of bank overdrafts. Neither time nor circumstances are on the side of those who wish to use student support as a means of selection.

Laurie Taylor



Madame Hortense?
That's right. Do come in, dear. And close the flap. We don't want the sand blowing everywhere, do we?
Er, no.

Now, sit down and relax. This is your first time at the scrying, is it?
Yes, I'm afraid so.
No need to worry. You'll find it all quite simple. Now place both hands on the side of the crystal ball.

Like this?
Not quite so tense, dear, or you'll break the ball. Just the fingers resting on the surface. Good. Very good. Now close your eyes and think very deeply about the question you want answered. Very deeply. Are you concentrating on your question?
Yes. Do you see anything yet?
Patience, dear. It's still very cloudy. But wait...

Yes, yes.
The mists are clearing... I see bricks. Many bricks.
Yes.

A wall. A long high wall. And dark country all around. Blackness everywhere.
Black country. A long high wall. It's Keele! It's Keele for closure! Madame Hortense, how can I ever thank you enough? That's such a relief. If only...

But lo.
Pardon?
But lo. The clouds are swirling again. There are storms brewing in the ball.

Yes.
Snow storms and high hills. People sliding down the hills.
Snow? Hills? Skiers? Good heavens. It's Stirling! Stirling and Keele to close! Madame Hortense.
But lo.

What now?
Piazas. Tall towers. Barracks. Liverpool Street Station.
Good God, Essex as well! Keele, Stirling and Essex.
But lo.

Not again.
I see rolling fens and a large building society and canary yellow shirts.
It can't be. Not East Anglia!
But lo.

No more.
The mists are clearing. I see a lake.
Oh no.

And a white rose.
No, no.

And a burning cathedral.
Madame Hortense. Please stop there. Let me cross your palm immediately. Please don't think me rude.

Not at all, dear. I find that nowadays very few of you vice chancellors ever stay for the full reading. Pull the flap to as you go, won't you?

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Oil chief to probe UGC

by Peter Aspdon

Lord Croom, chairman of the British National Oil Corporation and former head of the home civil service, has been appointed to head the Government inquiry into the role, structure and staffing of the University Grants Committee, it was announced yesterday.

The committee of inquiry, whose full membership will be announced next month, will have wide-ranging terms of reference, to be made explicit in a letter from the Secretary of State for Education, Sir Keith Joseph, to the UGC chairman, Sir Peter Swinnerton-Dyer.

The inquiry does not have a formal timetable, but effectively it must report back to the Government by next autumn, so that any changes recommended can be incorporated in the forthcoming White Paper.

The investigation into the UGC was one of the chief recommendations of the Jarrett report on university efficiency published earlier this year, which said that universities were increasingly seeing the committee as a tool to the DES.

UGC plans strategy of closures

by Peter Scott

The University Grants Committee could take the first steps towards closing universities as early as next spring if this winter's public expenditure review offers no hope of an end to the downward spiral of annual 2 per cent cuts in the university grant.

If the review now under way in Whitehall offers no such reassurance, the UGC is likely to write to Sir Keith Joseph, the Secretary of State for Education and Science, asking him to decide within six months which universities should close.

This would preempt the conclusions of the committee's present planning exercise which are not expected before May. Universities have until November 30 to submit their proposals on research priorities, future student numbers and financial forecasts.

The UGC itself will not propose a list of doomed universities. But it will tell the Secretary of State which universities and departments must be protected in the case of excellence. Soon after he became chairman of the UGC Sir Peter Swinnerton-Dyer made it clear that the closure of any university would be a political decision beyond the legitimate capacity of the committee.

With a general election likely in 1987, ministers are unlikely to welcome any move by the UGC to dump such a controversial decision in their laps. The Treasury in particular may interpret it as a clever ploy to put pressure on the Government to provide more money for the universities.

But the UGC insists that the crisis point at which the closure of universities becomes inevitable is now very close. Members of the committee believe it is urgent that the successful universities should be protected against the continuous erosion of their income.

Although Sir Peter has promised that no university will lose 1/2 per cent more than the average cut as a result of the first round of the UGC's present exercise in selective research funding, its long-term consequence might be to strip some universities of general research money. This possibility was specifically endorsed in May's Green Paper.

The UGC is also anxious to clear the decks before its selectivity initiative is properly launched. Before it sets about the distribution of the diminishing university grant, it wants to know among how many institutions the grant is to be distributed. For this reason the



Francis Crick: making brainwaves, 11

committee is likely to push the Government on the issue of closures sooner rather than later.
In any case Sir Peter is known to believe that the question of closures cannot be put off until after the next general election. But then too much

damage will have done to university standards by the continuing attrition. Despite the remark by Mr Peter Brooke, under-secretary of state for education, that the recent Green Paper was "rolling the wicket for rationalization", the Department of Education and Science is unlikely to welcome Sir Peter's brisk approach. The already difficult task of drafting the promised White Paper on higher education would be further complicated if it had to be done against the background of imminent university closures.

The UGC acknowledges that costs are lower in the polytechnics. But because of tenure which prevents them from shedding staff at the necessary rate, would find it impossible to match polytechnic unit costs. So closures are regarded as the only way to protect excellence if the cuts continue.

In the months building up to these life-and-death decisions the committee is keeping a low profile. Its outside assessors, who include senior DES civil servants and Mr Christopher Ball, chairman of the board of the National Advisory Body, are to be excluded from the UGC's September residential meeting when it will discuss its response to the Green Paper.

Poly degrees 'give better value'

by Karen Gold

Polytechnics and colleges may be more efficient than universities in transforming their raw student material into the best graduates, according to a study based on work at Brighton Polytechnic.

The study of material emerging from the Council for National Academic Awards transitory database at the polytechnic, looks at the idea of "value added" - the relationship between what higher education takes in to degree courses, and what it produces after three years.

It finds that if polytechnics and colleges took in the kinds of students universities recruit, they would be likely to get better results than the universities currently do.

The calculations are preliminary, because they were carried out before comparative levels of funding per student were published by the Department of Education and Science. These show that leaving research aside, over £300 more was spent on each university student.

The study for the CNA was carried out by Brighton economics lecturer Mr Tom Bourner, who runs the database. He has looked at the influence of factors such as resources, mode of study, A level results and subject studied on the degree results in both universities and the public sector.

The most significant factor of the ones he looked at in the numbers of firsts and good degrees is the subject studied. But the study also shows that high scores are positively associated with high honours results on both sides of the binary line.

To compare university and public sector effectiveness, Mr Bourner applied characteristics of university students in equations used to predict degree results in CNA institutions, and vice versa. He found that while CNA institutions had an average of 5.4 per cent first class degrees over 1976-80, universities had an average of 7.9 per cent first class students.

But according to the calculations, if the CNA institutions had taught university students, they would have gained 9.5 per cent firsts, while if the universities had taught public sector students, they would only have gained 4.2 per cent firsts.

Measuring by degrees, page 10
Leader, back page



Men out of court, say Oxford women

by Paul Flather

Blister complaints from Oxford University women's tennis team that they were regularly thrown off the university courts by the men's team last term have highlighted differences in funding and facilities for men's and women's sport.

A survey of 45 women's and mixed sports clubs by the university women's studies committee shows that even thriving clubs like rowing, cricket, and tennis, lag well behind the men - though most men's clubs have a larger membership.

University officials have been called in to investigate the tennis row. The women's team would like to see continued on page 3

New technology think tank to signal policy on research

by Jon Turney
Science Correspondent

Plans are taking shape in Whitehall for a new technology forecasting unit to help research policy-makers in government and industry.

The unit is intended to extend the work of a group set up last year by the Advisory Council for Applied Research and development to spot promising areas of science. ACARD, which advises the Prime Minister on applied research spending in government, was anxious to identify areas of basic research which might harbour the seeds of commercially promising technologies.

The report written by the ACARD group, under Dr Charles Reece of ICI, has not yet been published. But Dr Robin Nicholson, science secretary in the Cabinet Office is already exploring the possibility of setting up a new unit to take the results to academics and industry researchers and refine the original forecasts.

The new unit is unlikely to receive direct Government support, and major companies and foundations are being asked to contribute to the running costs. It will be located in an independent institution - possibilities include the Technical Change Centre in London, the Science Policy Research Unit at Sussex University and the Royal Society.

It will develop a "bottom up" approach to identify likely scientific winners, inspired partly by the extensive consultation which precedes major policy decisions on research in Japan. Research forecasting efforts in other countries, including Japan, were described in a separate report to the ACARD group from Sussex, published last year.

That report recommended involving a wide range of researchers in an expanded effort to draw up lists of scientific topics ripe for expansion. The ACARD group now appears to have accepted it is worth working towards this.

A further function of the unit will be to enhance contacts between researchers in universities and industry in framing new forecasts. But its main significance is as a signal that official policy-makers are becoming more drawn to strategic planning of government support.

This is becoming true of the Advisory Board for the Research Councils, which oversees the Department of Education and Science's contribution to civil research, as well as ACARD. The ABRC chairman, Sir David Phillips was a member of Dr Reece's group - a compromise reached after initial proposals to make the study a joint effort between the two committees.

Letters to the editor

Business and management



"Well," said the former vice-chancellor without a word of explanation, "is it demotion or promotion?" He thus revealed himself as a compulsive reader of *THE THES*. "Neither," I replied rather lamely, remembering later that I should have called it a *lateral arabesque*, a step familiar to students of Peter Principle. But I have now discovered that all the readers of *THE THES* (those happy few) are on tenterhooks ever since the editor dug out my old friend Laurie Taylor and his loony gang and I have decided to become a philosopher.

So let us sit upon the ground and tell sad stories of the plight of columnists. A dear friend in the education service in Lancashire writes to tell me that the three best reads of the week are John Cole in *The Listener*, Simon Hoggart in *Punch* and me in *THE THES*. I'm not sure that I agree with the order he put them in (alphabetical in fact) but I do agree with the inclusion of the other two. I read John Cole every week (catching his Northern Irish accent through the words more clearly than I get it from *Private Eye*) and Simon Hoggart when I go (fortunately rarely) to the dentist.

Leaving these three to one side, I have been wondering whether it could be that the better the column the more horrible the writer of it. I grew up (fairly horrible) and a smattering of writers, most of whom seemed repulsive, though I was told they all became nice as they got older and either died of drink or sobered up to a point when you wouldn't know whether they were drunk or sober. Starred speech and an unsteady step, I was assured, were the marks of disappointment, not de-bauchery.

But let me return to columnists, who look not drunk but unattractive. Roy Hattersley, for example, can write a brilliantly witty and observant column; can he be the same Hattersley who lumbers across the television set as an MP complaining about everything without a glimmer of wit? Can the astute Gerald Kaufman, who seems so self-righteous in the House, be the same writer who recounts the most hilarious episodes of Jewish life in Leeds? Is it the same Julian Critchley who used to talk the most pompous rot at meetings of the BBC's General Advisory Council who now entertains the readers of *The Listener* as well as of *Westminster Blues* with deliciously disarming revelations of his own imperfect morality and disloyalty to the leader of his party?

Just as I begin to be worried, I find consolation in the recognition that these men are all MPs and therefore probably professional liars. Other columnists are different. Bernard Levin is said to be a kindly man and always answers letters (I can testify) but he is not really a columnist because he writes at great length. Arthur Marshall is said to be as innocent as a lamb. Ambrose Waugh, whose columns suggest that he is arrogant, opinionated, conceited, and waspish (and therefore read by me whenever I can), is, I am told, really a sweetie.

As for myself, I am (to quote once again) peculiarly susceptible to draughts.

Patrick Nuttgens

Sir, - Your issue of June 28 did not give an adequate summary of Brian Griffiths and Hugh Murray's Institute of Economic Affairs paper to enable judgement to be made on the validity of your strictures. However I am reasonably familiar with their arguments and style and I suspect that you may have neglected the former because the latter got your goat as was no doubt intended.

Your leader shows clearly the gap which exists between those who write about the politics of education and those who educate. Business and management are not synonyms, although for many years administrators have tried to use the words as though they were. This confusion goes right back to the days of Sir Stafford Cripps and seems to have stemmed from a wish to do something about British industry

and commerce at a time when a government was in power which thought that "business" was a bad thing and the sooner abolished the better.

There are many successful business men. There are people who make money for themselves or for their organization who are not required to know more about management than an army corporal, eg unit trust "managers" (if they will forgive me for picking them out) and many highly effective managers who need know nothing about business eg school heads or chief constables. There is of course a substantial overlap. The functionaries of large companies in particular, but that does not mean that all business schools must cater for this market. Some schools - and where better than in the City of London - should concen-

trate on developing programmes of maximum relevance to business men who are likely to work in small firms: not necessarily in profits or turnover. They might even drop management teaching business altogether and might be persuaded to change their name to "management schools". It cannot be helped that a single title of "business school" imported without too much thought from the USA covers a multitude of sins. But please help stop the fusion of meaning in two words which have separate and useful identities.

Yours faithfully,
O. VESLEY HOLT,
Chaz Baitiat,
Chamoisvillat,
63560 Menat, France.

Leader, back page

Taxing classes

Sir, - I was extremely surprised to read your report on VAT on adult education by Felicity Jones (*THES*, July 5) because of the gross misconception of the Kent County Council position over the matter. Your article implied that the Kent authority had attempted to tax classes and that this attempt was successfully fought by Mrs Susan Fey. This was not the position. Kent has at no time supported the levying of VAT on adult education classes; on the contrary it has vigorously opposed VAT and has been to the forefront of the campaign against VAT on adult education courses. In fact Kent's stand was correctly reported in your sister paper *THE TES* (November 11, 1983).

With regard to Mrs Fey's role in the campaign, her support, together with that of other local authorities, of exempting adult education in the county from VAT.

Your faithfully,
C. OATLEY,
County Education Officer,
 Maidstone,
Kent.

Review logic

Sir, - The least one expects from a book review is a balanced idea of its contents. James Russell's review of *Piaget's Logic* (*THES*, July 12) misrepresents it by ignoring the central ideas.

First, genetic epistemology is rooted in demonstrable misconceptions in group and lattice theory and propositional logic (expressed by Piaget as "concrete and formal operations"). Yet James Russell attacks the indisputable evidence for these as over-quotations, with a strange reference to "two secondary sources" (only?). He provides no evidence to counter our detailed critique - only an elementary (and inaccurate) account of Piaget's use of groups and lattices and the relation of logic to action.

Second, a discussion of the implications of the critique for the system as a whole follows which shows its inability to unite principles of development with those of logic. This is the central problem of genetic epistemology, generating confusion between these in a vain attempt at solution. Apart from

a casual reference to conflation, James Russell ignores all this.

Third, chapter 8 places Piagetian thought in the wider epistemological context and chapter 9, after addressing itself to the issue of criteria for scientific method and an examination of genetic epistemology with reference to these, continues by demarcating between genuine and spurious mathematical symbolisms. All this might not exist for James Russell.

The reference to p314 is a detailed misrepresentation. It is the uncritical acceptance here of social premises which is linked with Piaget's self-confessed attitude to the Second World War. Nazism is not mentioned (except by James Russell himself). The point relates to the extension by Piaget of genetic epistemology from individual cognition to society in general.

All the foregoing is the thought which James Russell can only "guess". Piaget's misconceptions in mathematics and logic result, in our view, in a species of "scandal" which must challenge committed Piagetians, especially those holding a "computerized" view of mentality. Piaget's sys-

tem structurally anticipates this. The reviewer's abusive and unthoughtful tone reflects a contemporary belief that mankind's most profound problems can be resolved with a length of wire, a couple of switches and an updated abacus.

It is not our intention to criticize the use of mathematics and logic applied correctly and appropriately. In this spirit we challenge anyone to prove wrong in detail our analysis of Piaget's "logico-mathematics". And it must not be forgotten that the system and its implications stand or fall on this.

MURIEL SELTMAN
PETER SELTMAN
7 Pound Place,
Eltham,
SE9 5DN.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut or amend them if necessary.

Nuffield inquiry

Sir, - I am writing in connection with Karen Gold's useful feature on the Nuffield modern languages inquiry, the only accessible overview, as yet, of the work of the inquiry.

John White (*THES*, July 12) can rest assured that we are aware that what we have termed "languages only" degree courses - whether in the public sector or in the universities - include a great deal more than study of the language(s) as such. From the start, the inquiry has stressed that when we talk of "language learning" we include all that is done in its name.

Derek Winslow's point the previous week regarding our use of UCCA readings as the basic unit of our survey of university provision is a just one;

caution is called for when drawing conclusions from data kept on this basis. In particular, it is rather too dramatic to say, as Karen Gold put it in her article, that "almost 40 modern language courses in 13 universities were closed that year because they had few or no students". Most did indeed have few or no students, but we do not know that they were withdrawn for that reason.

Yours faithfully,
M. L. OWEN,
Research assistant,
The Nuffield modern languages inquiry.

Sir - Your article on the interim findings of the Nuffield inquiry into modern languages paints a gloomy picture of language courses.

The Institute of Export, the British Overseas Trade Board and a consortium of other concerned professional bodies asked David Liston and myself two years ago to investigate the British provision in management education for overseas trade with particular reference to the part played by such applied language courses. Our detailed conclusions were published in book-form (*Business Studies, Languages and Overseas Trade*) in April and show that this provision is healthy and growing. Above all, the graduates from these vocationally oriented courses, and especially those with work experiences abroad, have a significantly better record of immediate permanent employment than most arts graduates and indeed than some categories of pure science and engineering

Cambridge entrance

Sir, - Why does the photographic Judge look so much more worried alongside your article on Oxbridge entrance reforms (*THES*, July 5), than he does beside his excellent article on Scholastic Aptitude Tests? Perhaps, like your article, he has failed to grasp how much simpler the Cambridge arrangements will be to know that.

The Cambridge system will be part of the normal UCCA application process. Entry will be entirely by conditional and unconditional offers based on school leaving examinations, sometimes including STEP. (By the way STEP stands for sixth term examination papers, not entrance procedure as in your article.)

Cambridge has consulted widely with schools, and taken note of what they say, so it is hardly "groping in the dark". For example, a questionnaire sent to all schools in 1984 gave a clear raspberry to a fourth term examination. In response to school comments on the final draft proposals, the date of STEP has been moved from May to very early July.

What is said in your article about the distribution of open or no preference applications is bunk. Most such applications will be distributed to colleges with the fewest applications per place; but when the proportion of open applicants is high, a few will also be allocated to every college, so as to spread the share widely but fairly. However, the colleges with fewer preferences will, of course, have a better chance.

There is nothing sinister about governing rules. Any institution which leaves it foolish not to proceed in a way, and makes no apology for making high offers to good candidates.

Yours sincerely,
W. J. R. MITCHELL,
Admissions Tutor,
Magdalene College, Cambridge.

No mers

Sir, - Your (b) on the unwritten (*THES*, July 12) transitory working report looking at the future of group architectural education mentions architectural mergers between schools of architecture in Scotland. The Association of Scottish Schools of Architecture was set up some years ago to encourage cooperation between the Scottish schools, not to merge some of them as your report implies.

The association has given evidence to both this committee and to the Basher Working Party, pointing out the benefits of retaining the variety of Scottish architectural education and the desirability of solving the administrative problems which inhibit cooperation across the binary line. Both the ASSA and the Royal Incorporation of Architects in Scotland are convinced that the six Scottish schools should continue to exist.

Yours faithfully,
JAMES DUNBAR-NAISMITH,
Chairman,
Association of Scottish Schools of Architecture.

graduates. Naturally the existence of this sector does not solve some of the major problems mentioned in your article - the massive disproportion of provision in favour of French (evidenced even to marginally more jobs available to German speakers than French speakers) nor the worrying absence of boys on language courses at all levels after the age of 14. Our study does, however, indicate that market forces are at work and with encouragement from employers and Government such defects will not be irremedial.

Yours faithfully,
NIGEL REEVES,
Professor of German,
University of Surrey.

Brunel faces cuts shake-up

by Peter Aspden

The vice-chancellor of Brunel University, Professor Richard Bishop, has told lecturers that the university needs a fundamental change of direction if it is to cope with the threatened cuts on University Grants Committee funding over the next few years.

He has produced a plan for the university's future which he admits represents a "high risk policy", but which he sees as the most comfortable option facing it.

The plan involves an administrative shake-up along the lines of the Jarratt committee recommendations on university efficiency, with emphasis on strategic planning and attracting outside funds. Professor Bishop said Brunel was in a position to be pioneering in changes in direction which most universities would soon have to consider.

His proposals, which were presented to a special meeting of academic staff, included:

- Treating departments as small companies, which would share the task of earning extra funds among the mem-

bers of staff, and which would monitor their own performance;

- Setting up a strategic planning and resources committee which would allocate resources to cost centres and monitor an institutional plan;

- Streamlining the university's budget process, and the role of council in the process.

Professor Bishop said the university should aim to implement the proposals in his plan by 1986/87, with significant numbers of staff taking courses in accounting and management in the meantime.

He warned that, in the long term, departments which were unable to earn sufficient money might be driven to the wall - "as is now being openly said by the UGC".

If departments could not make up any shortfall in funding for two consecutive years, managerial failure would be the subject of investigation with lay participation.

Professor Bishop said that if the present situation was allowed to continue, departmental recurrent grants would fall to absurd levels, and neces-

sary staff reductions would leave the university unable to meet its commitments to students.

"To be realistic, if we go on as at present the very best we can hope for is still a miserable outcome - a debilitated and depressed university waiting for the next onslaught with apprehension. I am afraid my prediction is, at worst, bankruptcy and, at best, a total loss of the pride and the fun of scholarship, in teaching and research," he said.

He warned against Brunel turning itself into a commercial organization. "Our business is academic excellence and we shall forget that at our peril. Our academic standards must go on rising, or no scholar worth a damn would dream of working here."

He also told lecturers that they should not be content to be carried up the slope on the backs of their more conscientious colleagues. "Their replacement by more productive recruits to the staff would not only be cheaper, and so make life a little easier, but would drive Brunel up to the top of the heap in no time," he warned.

Sir Keith spells out teacher training policy

by Adriana Caudrey

Teacher training institutions must be of such a size as to be "effective and cost-effective" if they are to survive and to be successful, Sir Keith Joseph told the parliamentary Select Committee on Education, Science and Arts this week.

Sir Keith said that the National Advisory Body was currently engaged in "reconciling these factors". He also affirmed his support for housing teacher training departments within universities.

He told MPs that current population trends were resulting in a rising demand for primary teachers, but a lesser demand for secondary teachers, and this would have to be reflected in the allocation of teacher training places.

The Secretary of State for Education and Science drew attention to the growing shortage of graduates in sciences and maths entering the teaching profession, which is resulting in some schools having no specialists in these subjects nor in craft, design, and technology. He said that these were areas in which teaching tended to lose out in competition with the business sector.

While emphasizing that he was "treading diffidently", Sir Keith said that it might be possible to create especially attractive conditions and awards for prospective science teachers, to lure them into the profession.

He also pointed out that teachers required particular skills to enable them to teach mixed ability classes, and that many teachers did not have these skills "in abundance". He suggested that both initial and in-service teacher training should concentrate on these areas.

The Government was immediately to introduce new legislation aimed at increasing their powers to control standards in this field.

He also spoke out in favour of induction training, whereby a newly qualified teacher is taken under the wing of one more experienced. But he would not be drawn on the financial implications of these schemes, beyond saying that even to release experienced teachers represented a financial commitment.

Tackled as to whether he thought that teachers' low starting salaries might be turning people away from the profession, Sir Keith answered that these were no lower than those offered in other comparable professions.

However, the low starting salaries became more conspicuous because slightly older people were now entering the profession.

The future of Edinburgh University's dental school now seems secure following unanimous support for a compromise plan for new premises.

The school, attached to Edinburgh's dental hospital, has been under threat because of overcrowding and poor facilities which have been criticized for more than a decade.

Earlier this year, the university and Lothian Health Board proposed building a new school and hospital at a cost of £7.8 million, but this was vetoed as too expensive by the University Grants Committee and the Scottish Home and Health Department.

However, at a meeting in Edinburgh this week, all four bodies have accepted a new scheme from the university and health board to build new clinical facilities, but retain pre-clinical teaching in existing premises.

This will cost around £3.8 million, with the UGC paying only £500,000 of the capital costs.

The decision on how to deal with the Secretary of State for Scotland, Mr George Younger, but Edinburgh's principal, Dr John Burnett, said he believed Mr Younger would find the logic of the proposals irresistible.

"After 15 years, despite the very unfavourable financial climate the worth of the dental school and the necessity to provide high class patient care in Edinburgh has been recognized by all parties," said Dr Burnett.

There was still the hurdle of whether Mr Younger was prepared to fund the greatly reduced cost of the scheme, but the principal said it would be difficult for any minister faced with a clear statement from a government department, the health board, the university and UGC, to find reasons to oppose it.

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Britain is bright spot for graduate jobs

The new Scottish Vocational Education Council is to re-advertise the £28,000 a year post of chief executive. This follows the failure to select a candidate from a short list of four which included Mr Denis Hemingway and Mr Andrew Moore, chief officers of the former Scottish Technical and Business Education Council.

There is apparently some feeling that assumptions that the appointment was a "two horse race" may have deterred other applicants, particularly from Scotland.

In the United States over half of newly graduated PhDs cannot find employment in the fields in which they were trained. Unemployment among chemists and chemical engineers was at its highest for a decade in 1983 and the US Bureau of Labor Statistics predicts the rest of the 1980s will see surplus supplies of qualified architects, geographers, meteorologists, lawyers, university teachers, urban and rural planners, social workers, school counsellors, writers and editors.

West Germany has seen a fourfold increase in graduate joblessness in the last four years, to a total of 115,000. Teachers, engineers, natural scientists, lawyers and economists are the main sufferers here.

And even prosperous Switzerland can't find an occupation for all its degree holders - with their unemployment rate up from 2 to 5 per cent in recent years, a faster increase than the general joblessness rate.

Appeals can be made not only on behalf of candidates going into higher education this autumn, but also for those hoping for admission in 1986.

English and Welsh GCSE examination boards this week considered whether they too should introduce a special appeals procedure for candidates whose papers may have suffered as a result of the teachers' dispute. They rejected the proposal on the grounds that their existing appeals procedure could adequately serve such cases.

The Scottish Education Department is also asking colleges of education, central institutions and local authority further education colleges to consider reports on applicants from targeted schools.

The examination results were sent out this week, and Professor Ebsworth said head teachers had been advised to send reports to the Scottish univer-

New exam appeals system will aid pupils hit by dispute

ties early in August, to enable final decisions on conditional offers to be made by August 15.

The SEB is expected to take around a month to produce statistics comparing this year's results with previous years. Professor Ebsworth said he felt individual universities had enough flexibility to cope with the difficulties this season, but added: "Whether the system could stand this for another year or two, I don't know."

If disruption continued, and there was found to be a general failure to reach expected standards, the SEB would have to consider whether there should be additional material in university first-year courses.

Women in sports row

continued from front page

built a new joint pavilion and amalgamated with the men, but this has been opposed, partly it seems, because the men want to retain priority use of the courts.

Zoe Billingham, the women's captain, points out there are no other single sex tennis clubs in Britain.

Women's cricket has also taken off with 32 club members this summer. The club was given just £475 though Antonia Pooms, of St Hilda's, the captain, is realistic enough not to want parity. "We should not underestimate the differences between men's and women's cricket. But we do lack proper administration and we could do with a full-time women's coach."

Problems have arisen because of a huge increase in women admitted to Oxford.

Mr Jim Rallion, secretary of the university's sports facilities has a budget of £150,000 a year. "The problem is that funding for all sports is insufficient and it is a battle to decide who will get what."



Princess Alexandra receives a posy from Nicola Coyle, the niece of a member of Liverpool University's geology staff, after opening an extension to the department. The princess was at the university to receive an honorary degree.

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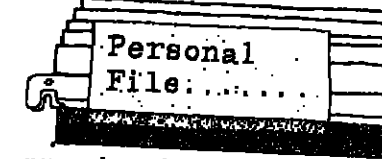
A driving force behind the legal traffic jam

by Paul Flather
Oxford has become a motorist's nightmare over the years. That is not the reason why one of the city's dons has been chosen to review the nation's increasingly complex traffic laws. But it should certainly encourage Dr Peter North to do a thorough job.

Dr North, a lawyer, who is principal of Jesus College, has been given the task of ensuring that the rest of us remain good drivers. As he says, we all think of ourselves as good drivers. The trouble is always with the other drivers on the road.

He will carry out the review - the first ever broad look at the sanctions on drivers - as head of an independent team set up this year by Mr Nicholas Ridley, Secretary of State for Transport, including four civil servant experts plus Professor Richard Allsop, professor of transport studies at University College, London.

The team will be honoursing a 1979 Conservative Party manifesto commitment and probably not a moment too soon. A recent House of Commons select committee reported that the



proportion of young people being injured and killed on the road had reached "epidemic proportions". The number of motorcyclists seriously injured, for example, has jumped from about 13,000 in the 1970s to more than 20,000.

Dr North will be looking at the penalty points system, whether current punishments for "causing death", or "reckless and careless driving", or "driving without due care and attention", and whether new penalties need to be created. "I have to produce tougher motoring laws for all those other bad drivers - but at the same time I don't want me - a good driver - interfered with," he explained.

Dr North will bring to the job considerable experience of sorting out complex public law issues. He has been a member of the Law Commission - the Lord Chancellor's legal think-tank

from 1976 to 1984, working on reports on consumer law, family law, insurance law, breach of confidence, and most recently child custody disputes.

He was an undergraduate at Keele College and returned as a law tutor for 11 years after two years at University College, Aberystwyth, and two years at Nottingham University. He has also had short spells at universities in Canada, the United States, and New Zealand.

His main academic interest is international law, though he has also written on tort law. His best known work is probably *Cheshire and North's Modern Law of Animals*, a revised version of the 1935 classic, on private international law, for example the validity of marriage laws in different countries.

In 1984 he was invited to become principal of Jesus. "It was a complete surprise. Quite frankly it was the one Oxford college I had never set foot in during my university days," he said, though the Jesus law tutors had themselves once been tutored by Dr North. The one big difference he notices in



the eight years he has been away - apart from the traffic - is the general shortage of funds, though he agrees Oxford has certainly been luckier than most. He will soon be playing his own part in the cuts debates, having wasted no time in being elected to the university's governing Hebdomadal Council. Meanwhile his eye is on all those Oxford drivers.

Eureka wins backing from Europe

by Jon Turney
Science Correspondent
The new European high-technology collaboration, Eureka, came a few steps nearer reality at a 17-nation meeting in Paris last week. But the details of the programme still remain to be worked out over the summer.

President Francois Mitterrand, whose government are the main instigators of the programme, pledged \$1 billion for Eureka projects. Britain stresses that future high-tech projects in Europe must be market-led, will look to the private sector to fund.

Possible areas for collaboration seen in part as a response to the technological challenge of the American Reagan's Strategic Defence Initiative, include computers and computer networks, robotics, biotechnology, materials and transport research.

Eureka will extend beyond the EEC countries, and ministers from Spain, Portugal, Switzerland, Austria, Sweden, Finland and Norway attended the Paris meeting, as well as representatives of the ten members of the EEC and the European Commission. They agreed to reconvene in Germany in the autumn to examine more detailed plans.

The plans will be drawn up by French-dominated working groups, already in existence, and a new committee of senior officials from 17 prospective participants. Sir Robin Nicholson, chief scientific adviser in the Cabinet Office, is likely to sit on the committee for Britain.

British officials were generally pleased with the outcome of the Paris discussions, feeling that the thinking behind Eureka had moved toward the British view that the essential aim is to harness the power of industry. But crucial questions about overall government contributions and the link between Eureka projects and the European Commission's own research policies still have to be resolved.

Support grows for TVEI

by Patricia Santinelli
All but one of the local education authorities which have been against making a bid for Technical Vocational Education Initiative projects have now done so, according to the Manpower Services Commission.

This was revealed by Mr Bryan Nicholson, chairman of the MSC, just a few days away from the July deadline for applications to the project. Speaking about TVEI at York University, he said the MSC had received over 30 new proposals - this includes those who have never put a bid as well as those who have been turned down - for 1986 and therefore the coverage of the scheme was total.

By September this year a total of some 73 local authorities will actually be involved in the scheme which provides a range of subject options for 14 to 18-year-olds. Those authorities which up to now have never put a bid were initially angry at the way the Government launched the scheme in 1983. There was no prior consultation and funds were given direct to the MSC.

Mr Nicholson said he still had some worries, particularly over admissions policy in further and higher education and the need to strengthen links with employers.

"It is important that TVEI students should be admitted into the universities, and that employers should welcome people with vocational and technical qualifications and give them due recognition," he said.

He added that for this reason assessment and accreditation were crucial to the successful development of TVEI. What was needed was an effective mechanism for the pursuit of a common policy and a coherent system of non-education, although he did want schemes to be replicable.

He also pointed out that current models of TVEI were capable of considerable further development, whether in cooperation with industry, Government, schools or local authorities in partnership with each other.

Call for rethink on Unesco

by Huw Richards
"Guarded optimism" was the keynote as the House of Commons foreign affairs select committee reviewed developments in Unesco following official notice of Britain's withdrawal.

The phrase, in an Overseas Development Administration report on Unesco, was endorsed by William Dodd, UK representative on the agency's 51-strong executive board.

Without setting precise criteria for the final decision on withdrawal, to be taken after this autumn's meeting of the Unesco conference in Sofia, Britain has called for organizational reform, budget restraint, a shift in activity away from the Paris headquarters to action programmes, in the Third World and the de-politicizing of some programmes.

Mr Dodd told the committee that while none of the problems had been wholly eradicated, progress had been made.

He reported that organizational reforms were under way with a calendar now set for implementing 117 proposed changes in procedure. An investigation carried out by the general accounting office of the United States had discovered "inefficiency, incompetence, inefficient administration and over-centralization, but could find few examples of gross maladministration."

"These problems are to a great extent found in all large bureaucracies," he said.

He agreed that the 51-person executive was unwieldy, risking a concentration of power in the permanent secretariat, but pointed to the need to represent different interests and regions - a problem newly confronted whenever the executive attempts to set up subcommittees.

Britain had succeeded in ensuring that members' contributions were not increased to compensate for the loss of income when the United States withdrew. "If we can make this stick at the conference we've done fairly well," he said.

Mr Dodd also hopes to see the shift in balance of programmes towards action programmes ratified at Sofia, and reported uneven progress in the controversial area of political programmes.

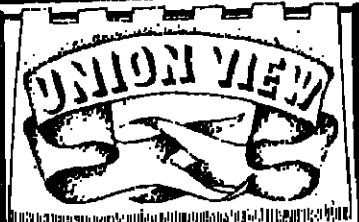
There has been a downgrading since the last executive board of highly political programmes. The western board members have been able to modify the human rights and media

programmes. At the last two executive board meetings delegates have gone out of their way to be on their best behaviour and avoid political rows.

He added that the question of what is "political" is very much a matter of personal opinion, agreeing with Mr Ian Mikardo (Labour) that the anti-Unesco activities of the right-wing American Heritage Foundation, who claim that the agency is a hotbed of KGB activity, are as political as those of the people they are attacking.

Mr Dodd suggested that British withdrawal would have serious consequences for Britain and Unesco. British prestige in the organization is out of proportion to its subscription because of its part in funding it and the contribution of British staff.

Withdrawal would be a serious blow to Third World countries, including many Commonwealth states who regard Unesco as vitally important. It would probably lead Canada, West Germany, Japan and the Netherlands to review their own position and could cause other western nations to quit. This in turn would reinforce the heavy-handed approach seen from the Soviet bloc since American withdrawal.



Green Paper has got it topsy-turvy

At the press conference which launched the Green Paper on higher education in May, the minister with responsibility for higher education, Mr Peter Brooke, was asked: "Is the Green Paper reflecting Government policy that students studying for degrees in polytechnics and similar colleges shall be consistently funded at a lower level than students studying for equivalent degrees in universities?"

Mr Brooke's reply was: "No, that's just the way it comes out."

It must be tempting for the polytechnic student - and for the part of the NUS which represents polytechnic students - to ask why it is that "the way it comes out" and, even more, is it reasonable?

Well, it is not reasonable. A student who enters a degree course with two A levels at D grade should need more resources, not less, than one who enters with four A levels at A grade. Yet the reverse is the case. Indeed, the correlation is such that the less tuition the student needs, the more is made available to them.

Of course, there is an explanation. The universities, says the Green Paper, spend more money on "land, premises, staffing and equipment". There is also a justification. The Government would, says the Green Paper, "need to be convinced that the differences between institutions would actually produce a net benefit to education as a whole, and hence to society."

Really? How much more difficult might it have been to ask the Government to convince anyone, let alone someone intelligent enough to get into a university or polytechnic, that there would be a benefit to society if institutions required to produce graduates to the same standard were funded as disparately as the Green Paper blandly accepts.

Yet even those who should know better are misled. The NAB even have accepted that, before calculating the difference in funding between polytechnics and universities, the latter shall subtract 30 per cent from their total of resources for "research". The paper on intersectoral comparisons, on which the funding figures are based, explains that the subtraction of 30 per cent cannot be justified. It is just the HCF (highest credible fiddle).

The Morrison Report indicated that a subtraction of 15 per cent could be justified - provided that it was assumed there was no research in polytechnics at all. Even that figure is called in question by various reports.

The idiosyncrasies could be excused if the Green Paper was looking particularly green: however, the major area which one might expect to discuss has been pre-empted before the discussion has started, namely the binary divide which exists between well-funded undergraduates and poorly funded undergraduates depending on whether the name of the institution is university or polytechnic (or college of higher education).

The Association of Polytechnic Teachers is a non-political association, but on this occasion there should be common ground between all politicians that, in the words of Enoch Powell, parliament should not do those things "it is there not to do". And parliament is there not to add to the cock-up theory of history.

Dr H. L. Mason

The author is assistant national secretary of the Association of Polytechnic Teachers.

Karen Gold reports from the Council of Local Education Authorities conference at Loughborough

Anger at lack of planning

The Government's Green Paper on higher education came under fire from Wakefield Labour councillor Mr Chris Heintz.

Although the Government recognized the value of higher education, its response to the opportunities presented by fewer 18 year olds was a return to more traditional attitudes.

The Green Paper failed to deal with proper planning for higher education, said the motion proposed by Wakefield and carried by 44 votes to 10.

The policies contained in the Green Paper had been around a long time and said nothing about the quality of higher education in this country.

Mr Heintz said that the quality of higher education in this country was poor, and the public sector, said Neil Fletcher (Labour, ILEA).

Figures collected by the National Association of Teachers in Further and Higher Education showed before the current round of cuts that some of professional workers had 80 per cent chance of going into higher education, while daughters of unskilled manual workers had a 1 per cent chance, said Miss Hilary Armstrong (Labour, Durham).

"These figures give the lie to the idea that there are not people who, given the right sorts of opportunities and access, would not go on to higher education," she said.

The conference carried the motion expressing concern that the Government's increased target numbers for teacher training should not be achieved at the expense of the rest of higher education.

Alliance is shown the green card

Anyone could tell which local education authority representative had been involved in nose to nose pay negotiations with the primary and secondary teachers. They were the ones with black shadows under their eyes.

Normally delegates to the Council of Local Education Authorities annual conference look exhausted by the time it is over. This year, with several of them coming from the Burnham talks to see the sunrise over Loughborough, they looked exhausted before it had even begun.

Audio-cassette they were not consulted on the conference's annual "unity" motion: local education authorities half-hurrying their hatches for a mutual assault on the Department of Education and Science.

This was the first CLEA conference attended by Alliance councillors in any numbers, following their successes in the last local elections, and they proceeded to make their presence felt by chucking in last minute amendments and then withdrawing them after much grovelling from Labour (now the majority party) and the Tories.

The irony of this, which did not go unnoticed among Labour left-wingers over lunch, was that the Alliance was being pressed to withdraw anti-Government amendments - such as the call for Sir Keith Joseph's resignation - which had more in common with Labour feelings.

But such squabbles were nothing

NAFE under microscope

Every aspect of non-advanced further education must be radically reviewed and revised, Secretary of State for Education and Science Sir Keith Joseph told the conference. Sir Keith admitted that he had not paid enough attention to NAFE until his third year in office, because the schools and higher education had monopolized his attention.

Revision of the system would take significant time and involve difficult negotiations, he said. Increased efforts had to be made to find out what was going on in NAFE, and to ensure that the system would be used to the benefit of students.

Sir Keith said he welcomed the increase in interest of British employers in education and training, and the close relationship between local authorities and the Manpower Services Commission in planning NAFE, and the development of the two-year Youth Training Scheme.

He recognized that funding this was a serious problem, but he said "None of us can afford to stand back from this major new development in the education service in particular has a responsibility and an opportunity to contribute to ensuring quality within the scheme - and the amount of business which the colleges retain and capture will be influenced by how well they are seen to do this."

Festival guides win reprieve

A 48 year tradition of guided tours of Edinburgh's historic Royal Mile during the Edinburgh Festival has been saved by Edinburgh University's extra-mural department.

The department's director, Mr Basil Skinner, said in the 1930s the Edinburgh Festival Association was to be disbanded since the Festival's organizing body was withdrawing its administrative support, costing some £200 annually. Mr Skinner has said his department will take over the costs.

Art of course marketing

Academic entrepreneurs wanting to market their courses to industry can now obtain a guide on how to do it through a Department of Education and Science PICKUP initiative.

An information pack, developed by staff at Longlands College, Middlesbrough for use by lecturers when they visited local firms, is to be promoted by PICKUP as a model for other colleges.

It provides lecturers with information on the whole range of work and facilities at the college and contains:

- Briefing notes on points likely to be raised during the visit;
- Print-outs showing the full range of college services;
- Course programmes from the visiting lecturers' department;
- A give-away folder summarizing the college's work.

Longlands' industrial liaison director Graham Watson explained: "Firms are impressed with a college which matches the marketing professionalism of industry."



Sir Keith talks to admissions clerk Laurie Adams

Sir Keith visits OU - twice

Sir Keith Joseph, Secretary of State for Education and Science, made a swift return to the Open University last Saturday having had to cut short his initial visit to answer an unexpected Parliamentary Question on the teachers' pay dispute.

Staff came in specially to show Sir Keith the business school, technology faculty and continuing education department. He had singled out these areas as of particular interest but had not reached them before his enforced departure.

During his first visit Sir Keith was told by students that the university's financial problems had drastically affected tutorial support and other services.

In response to a question about the degree of feedback from tutors, the four students told him that tutorials, which are often the only personal contact other than the summer schools which OU students experience, were becoming fewer and fewer.

Staff review worries lecturers

by Peter Aspden
Lecturers at the London Hospital Medical College are worried about an internal review which has been asked to establish an "affordable staff structure".

The lecturers fear the review, being carried out by an academic team, will act as a prelude to a renewed threat of redundancies at the college, which were first contemplated last October in the light of unexpected financial difficulties.

It has been devised which eliminated the need for redundancies, and that its financial position was not as unfavourable as had been predicted.

But now the AUT fears that a new brief given to the academic board's development and planning team to look into the college's staff structure could once again lead to selection for redundancy. The union believes the team has already approached external assessors to advise on the role, structure and size of departments.

Mr Malcolm Kellogg, London regional officer of the AUT, said there was a great deal of uncertainty about the nature and purpose of the proposed review, but the team did appear to be taking ominous steps.

"The team has been given its brief by the college's finance committee, even though it is a subcommittee of the academic board, which has not discussed the exercise at all - that is particularly worrying," he said.

He said the union was worried that the planning team and the external assessors might come up with recommendations which would lead to worse staff-student ratios at the college. Further talks were due to take place between the union and representatives of the college this week.

Curtain up

Sheffield City Polytechnic opens a new drama studio next term, with series of short courses including workshops with actors, writers and directors from the city's well-known and adventurous theatre The Crucible.

Rise of 42 per cent not enough for Scottish museums

The Scottish Museums Council, which supports Scottish university collections, has warned of the urgent need for more funds, despite a 42 per cent increase in its Government grant.

Professor Frank Willett, director of Glasgow University's Hunterian Museum and Art Gallery, and the universities' representative on the council's board, said the increase in grant showed Government recognition that Scotland was lagging behind England and Wales, but could be seen only as a first step.

The Government was supposed to provide 50 per cent of the purchase price of exhibits, but three months into

the financial year, grants in Scotland had been cut to 40 per cent, with funding expected to run out by January.

The council says in its annual report that last year it could give grants to only 70 of 300 schemes, and as a result: "Many collections which have mouldered in neglect and decay for decades will continue to do just that."

The council is hopeful that further Government funding will be forthcoming, and has also commissioned a study from a New York firm of museum fund-raising consultants in a bid to raise more money from the private sector.

Professor Willett last month warned that universities themselves were often unaware of their own collections, since many were based within departments without full-time staff to run them. The council's campaign for increased funding could encourage universities to make their collections more accessible, since those closed to the public were not eligible for funding on a matching basis, he said this week.

Professor Willett, who is also chairman of the Advisory Panel on Education in Museums, added that involvement with school groups was a very good public relations exercise for universities. Many people viewed the

universities with "a certain suspicion" and were inhibited about visiting them, but schoolchildren who had attended courses frequently returned later with their parents.

Last year, the Hunterian ran courses for more than 15,000 schoolchildren through the museum's education service.

A review of the Scottish universities' collections will be included in a report expected in October from a Museum and Galleries Commission working party chaired by Professor Hamish Miles, director of the Barber Institute of Fine Arts at Birmingham University.

PARTY LINE

The reality behind the blustering

As the House goes into recess today we leave Parliament with many questions unresolved. Governments are always delighted when the House is not sitting and I am sure Mrs Thatcher and her colleagues will be more relieved than most to get away from the banana skins and barbs that have been their weekly diet for some time past.

Scottish members with children at school, along with their counterparts from other parts of the United Kingdom like myself, will be delighted to have won their long campaign to start the recess earlier so they can see something of their families while their children are away from school. But in addition to that pleasure we can all go away to contemplate the uncertainty of the present political position in the country exemplified in the Brecon and Radnor by-election and the latest round of opinion polls.

The situation is, of course, quite unprecedented in postwar years. In the two years since the last general election the Alliance has remained an effective third force at considerably higher levels in both opinion polls and by-elections than ever before. This is not, as Mr John Gummer and Conservative spokesmen have claimed, the protest vote

phenomenon of past years. It is a sustainable trend that has been developing over a long period of time. I have no doubt that a fundamental change in allegiances and opinion in the country is taking place.

The Government ends the session giving the deeply damaging impression that it has lost its sense of direction and is as a result becoming very accident prone. Like most other people in Westminster I do not believe that we are going to see a return to direct grant schools or the introduction of a voucher system but the characteristic off-the-cuff comments from Mrs Thatcher which led to renewed speculation about this only create more confusion.

The teachers' dispute is another example of gross mishandling by the Government. The last round of discussions with Mr John Pearson demonstrated how the negotiations might have proceeded successfully

if we had had a Secretary of State with the right sensitivities and a Government with the right priorities. I still believe that the dispute should not and need not have gone anything like as far as it has if Sir Keith had not bungled it in the early stages.

The generous and immediate awards to the judges and other senior public servants, along with the realization that some sections of the community, like the police and large parts of the private sector, are getting high settlements has planted the seeds of the damage being inflicted on children and our schools.

I do not think the National Union of Teachers and the teachers have covered themselves in glory either. It strikes me there is as much uncertainty about the future structure of representation and negotiations for teachers as there is about the future of our politics.

I get increasingly depressed about the whole future prospects of the country when looking at situations like this. As on so many other fronts we are digging ourselves further into a hole and losing valuable time in moving ahead towards a higher skilled, higher educated population that is so desirable and desperately needed.

Every bit of evidence that I see from other advanced countries in the world demonstrates the need for us to be moving in this direction. The quality of our intellectual and cultural life, as well as our material standards, are at risk. I suppose I should take some consolation from the fact that the Government's unpopularity and loss of momentum is the precursor to a new administration. But the thought of having to wait and waste another two or more years before being able to do anything effective about changing direction is deeply depressing.

The political situation I referred to earlier leads inevitably to questions about what would happen after a general election if no party had a clear majority. A lot of arrogant nonsense is being talked about this by Labour and Conservative spokesmen at the present time. They will not be able to do it. They will keep their heads in the sand or the clouds for very much longer.

If the Alliance has won a substantial number of seats in the next Parliament it follows that we will have polled the votes of over 30 per cent of the electorate. In those circumstances it will be palpably obvious that no party has a clear mandate to try for trying to do so as though it had.

Behind all the blustering there is, of course, a private acknowledgement that agreements could be made. I don't think people like the three contributors to this column would find any difficulty in doing so, although my two other colleagues might not thank me for saying so!

Ian Wrigglesworth
The author is Social Democrat MP for Stockton South.

Years of cuts take their toll

from John Walsh

DUBLIN The effects of several years of cutbacks are increasingly alarming academics worried about the lack of new blood in university staffrooms.

In University College, Galway, for instance, 88 per cent of the full-time academic staff is over 35 years of age. In University College, Dublin - the country's biggest - only 1 per cent of the staff is under 30 and only 10½ per cent under 36.

Like the other institutions Trinity College also has to cater for more students but with slightly fewer staff.

In his annual report the college treasurer Mr F. C. Winklemann said that over the past year financial pressures on staffing levels, as well as policy pressures from government to contain staffing costs and to comply with public sector norms, continued unabated.

Throughout most areas of the public sector - except for the security forces, primary and secondary teaching - there are very tight constraints on filling vacancies. In general only one in three vacancies can be filled.

The jobs embargo coupled with financial constraints has resulted in about 340 posts being frozen in the country's five university colleges, with little prospect of an early improvement.

Galway college president Dr Colin O'Brien warned recently: "If the embargo lasts for another decade our institution can hardly be expected to generate many innovative ideas for industry."

Experience, he said, had shown that in science and technology innovative ideas were associated with academic staff. The registrar at University College, Dublin, Professor Patrick Masterson believes a concerted approach will have to be made to government on the issue. He thinks consideration should be given to the idea of short-term three to five-year post doctoral contracts.

Private solution to exodus

from Wachira Kigitho

NAIROBI The shortage of places for students in the two national universities has forced the Kenya government to consider establishing a private higher education sector.

The move has been precipitated by the large number of students who have university entrance qualifications but cannot be accepted at the University of Nairobi or Moi University at Eldoret. This problem has in the past created an academic exodus to India, according to officials in the Ministry of Education, Science and Technology.

According to director of primary education Dr Gilbert Oluoch enrolment of 27,000 at independence to 655 schools has risen tremendously since independence. The number of primary schools has gone up from 6,658 with enrolment of 891,533 in 1963 to 11,847 with enrolment of 4.2 million in 1983.

Dr Oluoch said secondary schools have increased from 142 with enrolment of 227,000 after independence to 655 with enrolment of nearly half a million in 1983. He noted that the abolition of school fees at primary level 10 years ago has made enrolment higher in both sectors of education.

Under the Universities Act 1985 which comes into force later this year the government will be required to enhance university education in Kenya and discourage students from seeking higher education outside the country.

Apart from the provision for establishing private universities the Act will also pave the way for a national commission for higher education to coordinate higher education.



Nairobi students: too many for too few places

In order to maintain high standards the universities will be closely controlled by the government, which will have the authority to scrutinize curricula. Persons or bodies interested in establishing a private university will be required to apply to the commission before approval is sought from the president of Kenya.

The president will have the right to revoke decisions by the commission or withdraw a university's charter. But in order to safeguard the interests of the proprietors the government will allow representations to be made before the charter is ended. Degrees already awarded will not be

withdrawn or their validity affected in any way.

Other duties of the commission will be to control the admissions on national basis of all private and state controlled universities.

The commission will also be charged with identifying areas of specialization to limit the number of qualified personnel in any one field. Kenya has been having problems with too many arts graduates chasing too few jobs.

According to officials in the ministry of education the Act will attempt to standardize degrees and diplomas awarded by divergent institutions in Kenya.

Pilgrimage to shrines of record

from William Norris

WASHINGTON A migratory flock of American academics is about to hit the shores of Europe, propelled in part by \$300 grants from the National Endowment for the Humanities. The scholars, 312 of them altogether, are engaged in research which requires access to specialised material, and the biggest single bunch of more than 60 is headed for the British Isles.

The subjects of their quests range from the arcane to the bizarre. Roger Buckley, from Storr's University of Connecticut, will be spending his time among forgotten documents in the Public Record Office in Kew, courts martial between 1793 and 1815.

Thomas Calhoun of Delaware will be searching the British Library for manuscripts of the 17th-century poet Abraham Cowley. And Maria P. Harlan from Tallahassee, Florida, intends to look for evidence of religious violence in the 15th century among the tomes of Worcester Cathedral Library and the Bodleian.

An overall view of the successful grant applications - roughly half were approved - seems to reveal that the endowment for the humanities places a premium on the obscure.

The grants are the first to be made in a continuing programme, and more will be awarded in September and January. Applicants must be American citizens or have lived in the

Copenhagen bears brunt of staff cuts

from Christopher Follett

COPENHAGEN

The Danish Ministry of Education is to make swinging cuts of an average of just under 3 per cent in budget allocations for Denmark's five universities for the academic year 1985/86. Worst hit are the humanities faculties, where cuts averaged around 5 per cent, least affected are the sciences.

Danish state allocations to the universities of Copenhagen, Aarhus, Odense, Roskilde and Aalborg are to be set at 1.97 billion Danish crowns (£137 million) for the coming year, as opposed to 2.03 billion crowns (£142 million) in 1984/85, with staff cuts of 2.6 per cent, reducing the number employed at the universities this month from 7,117 to 6,934.

Admissions are to be reduced by 6 per cent to 8,230 for all the five universities - particularly badly hit is Copenhagen University, where 10 per cent cuts in intake are to be made and only half of all the 6,500 new applicants will be granted admission.

The major cuts in government subsidies are imposed on Roskilde University, on the Baltic island of Zealand near the capital (16 per cent) and the University of Copenhagen (3.7 per cent). The cuts mean that several

institutes and in some cases faculties face closure this autumn. Among those under threat are the Institute of Medicine and Chemistry at Copenhagen and the Faculty of History at Aalborg.

Severe restrictions including cuts in research staff are to be imposed on the well-known Niels Bohr Institute of Theoretical Physics in Copenhagen, marking the centennial celebrations this year of the birth of the institute's founder, the Danish nuclear scientist.

The cuts - to be formalised in September - are part of a reform of university education in Denmark, instigated by Mr Bertel Haarder, the Liberal minister of education and designed to create shorter, more streamlined courses.

Shock figures from the Danish Council for Education Assistance revealed that at the end of 1984, 175,000 students owed a total of 8.15 billion crowns (£570 million) in state-guaranteed bank loans taken for educational purposes, representing an alarming 5 per cent of all loans made by Danish commercial and savings banks. By last year, the recently published figures show, 4,040 Danish students had accrued "hopeless" individual debts in excess of 200,000 crowns (£14,000) compared to a "mere" 1,725 in 1982.

Workshops set to aid Third World

The work programme of the International Centre for Genetic Engineering and Biotechnology will commence this

month. The centre, which will be based in the Indian city of Bangalore, will include the installation of computer facilities to link members of a panel of 15 eminent international scientists, advisers, two meetings of the panel, initial training activities and the appointment of a director, a programme management officer and support staff.

A \$559,000 budget for the 1985 programme, together with an estimated \$15.8 million for 1986-88 are being donated by the Italian government from its office of support to the centre. The programme for 1986-88 will include a research and training project at each site as well as a project for affiliated centres. These are to begin as early as possible next year.

The work programme was agreed by the centre's preparatory committee at a meeting in Vienna held under the aegis of the UN Industrial Development Organization (UNIDO). The wider support of selected universities through the establishment of UNIDO chairs in Third World industrialization issues.

The first such accord has just been reached between UNIDO and Université de Sciences Sociales et Humaines de Grenoble. The programme is intended to share the experience of UNIDO with university staff and students and to involve them in industrial development around the hungry belt of the globe.

Under the present agreement, UNIDO chair in industrial economics, place documents and studies at the disposal of the organization, hold training seminars and encourage technical assistance projects.

In turn, UNIDO staff will participate in doctorate level teaching at the university's faculty of economic sciences. The organization will contribute its publications and studies to the faculty library and provide logistical support for university staff and students who are seconded to carry out research at UNIDO headquarters or act as experts on development projects.

Dr Abd-El Rahman, the executive director of UNIDO, hopes that several similar agreements with other universities may be announced soon.

Teachers face tougher tests

from David Dickson

PARIS

The French Government has announced that it intends to make substantial reforms in teacher education which will, for the first time, require all new school teachers in

France to be approved by the French council of ministers in the near future. Their aim is to increase both the professional competence and the social status of the teaching profession, as well as to reinforce the new curriculum changes which the minister of education, M Jean-Pierre Chevènement, is introducing in schools at all levels.

At present, teachers can qualify in two ways. The officially-designated route is to take a three-year teacher training course in one of the *écoles normales* immediately after taking the school-leaving examination, the *baccalauréat*.

An equal number of teachers, however, are recruited directly into schools after successful completion of the examination taken by all students at the end of the first two years of undergraduate study, the diploma of general university studies (DEUG), but without any professional training.

Starting from the end of the next academic year, it will no longer be possible to enter the *écoles normales*



The old, old story of air

from William Norris

WASHINGTON

The hunt is on in the United States for old air. Any old air will do, but the older the better. The purpose of the exercise is to discover whether the "greenhouse effect" which is thought to threaten severe climate change through increasing levels of carbon dioxide in the atmosphere, is really a recent phenomenon.

To find out how much carbon dioxide there used to be in the air, scientists from Los Alamos have been searching museums across the coun-

try for items sealed in airtight containers. Antique telescopes, hour glasses, and ancient brass buttons may all contain tiny reservoirs of old air which can be extracted and analysed. Maritime museums with collections of navigational instruments are seen as an especially rich source.

The team tried their luck with some ancient Buddhist cremation jars in Hawaii, but they were not sealed tightly enough. Soon the search is likely to move to Europe where everything, the air included, is well-known to be archaic.



Jean-Pierre Chevènement: reforms

direct from school, and all potential teachers will be required to have spent at least two years at university and to possess the DEUG. Entrance to the teacher training courses will subsequently be decided on the basis of a new, post-DEUG examination, for which both universities and advanced technical colleges will offer preparatory courses from next September.

Successful entrants will then take a two-year course of professional training with an emphasis on teaching methodology, the applications of educational research and the use of new technologies in the classroom.

All students taking such courses will receive financial support, and will after successfully completing the course be required to work for at least eight years for the state (and not merely, as at present, for the education ministry).

In reforms, which had been strongly pushed by the socialist government's first minister of education, M Alain Juppé, the new system will be

designed to be approved by the French council of ministers in the near future. Their aim is to increase both the professional competence and the social status of the teaching profession, as well as to reinforce the new curriculum changes which the minister of education, M Jean-Pierre Chevènement, is introducing in schools at all levels.

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Row over 'courses for sale'

by Geoff Maslen

MELBOURNE

Plans by the Australian government to market higher education in Asian countries have been attacked by academics and student groups.

Under the new arrangements, Australian universities and colleges of advanced education will be able to offer courses for foreign students either in Australia or overseas, provided those enrolling pay the full cost of their education.

The education minister, Senator Susan Ryan, said the new arrangements would allow institutions to offer courses for overseas students while protecting local students' rights of access to higher education. Government funds could not be used to subsidize such courses.

But student groups are outraged at the proposal and, together with academic associations, have condemned it as a dangerous precedent in the privatization of Australian tertiary education.

A student group called the Overseas Students Campaign Against Full Fees said the policy was an abrogation of Australia's foreign aid responsibilities and would deny many Asians a place in higher education.

Senator Ryan, however, claimed the marketing of courses would contribute to Australia's overall export performance and economic growth, as well as benefit foreign relations. According to government sources, south-east Asian countries have already expressed great interest in the scheme.

Last week, officials from the Australian departments of education and foreign affairs visited the Singapore

in an effort to gauge the demand. Guidelines laid down for the scheme provide that institutions may enrol full fee paying students only where places cannot be filled by Australian or subsidized foreign students.

Last year there were proposals to create a new college in Western Australia to cater exclusively for foreign students and offering courses mainly in business studies. The plan was for the West Australian College of Advanced Education to take responsibility for the examination of students, conferring of degrees and accreditation of courses. Association with an established institution was essential because Western Australian legislation does not permit the granting of degrees by other than prescribed institutions.

"Private university" proposals then began to proliferate. The Western Australian Institute of Technology and the Royal Melbourne Institute of Technology also proposed setting up foreign-based campuses offering external degree to students taking Australian courses in their home countries.

In the short term, the government intends to resolve this question by selecting temporary, unqualified teachers from those who have passed the new, post-DEUG entrance examination. These will spend one year in the classroom before taking up their two years of professional studies.

the need for student access to a wider range of patients, additional clinical schools were set up in Christchurch and Wellington.

This increased the costs of medical education significantly, not just in the continuing employment of 21 professors for the seven clinical disciplines - one professor for each discipline in each of the clinical schools, against Auckland University's seven professors dealing with the same number of students at Auckland's one clinical school.

Otago Medical School staff see the closure of either Wellington or Christchurch clinical school as a way to reduce staff numbers, and administrative, travel and operating costs and leave two schools which would be academically more viable.

Maintaining the three schools, they argue, will need additional funding and will mean continuing with clinical departments that are too small to be viable.

Politically the choice will be difficult. Christchurch clinical staff are

closer to Dunedin and not only would it be cheaper for Otago to maintain that school but there is already a tradition, probably because it is in the same island, of rather closer links with the parent school.

But neither Christchurch nor Wellington would be likely to wish to lose facilities which currently enhance local clinical care of patients.

Mr Thondaman asked the University Grants Commission for further time for the students on the ground that increased ethnic tension in the north had prevented the students from applying in time.

Court overrules action against levy defaulters

from Benny Morris

JERUSALEM

The courts last week frustrated the Israeli government's attempt to levy an extra \$150 from the country's 65,000 university students.

The Beersheba district court issued a temporary injunction forbidding Ben-Gurion University of the Negev from preventing students who have not paid the \$150 state levy from taking part in year examinations or from receiving summer dormitory lodgings.

The levy was imposed on all students as part of the treasury's recent efforts to cut the state budget and increase state revenues. The government order stated that students not paying the retroactive fee, which next year will be \$300, will not receive transcripts, degrees or documents stating that they are students, which allow students tax and other reductions.

The levy is opposed by the National Union of Students, which called on all

students not to pay it as they said it was illegal and not allowed for in the tuition fee accords between the union and the treasury.

Ben-Gurion University announced that it would not allow students who had not paid the levy to sit for exams and to receive summer lodging in the university's dormitories. Ben-Gurion students union chairman, Nissim Cohen, subsequently applied to the district court, which issued a temporary injunction against the university.

Ben-Gurion University president Professor Haim Iltai said the university would abide by the order but said the university's measures were in line with the government order.

Ben-Gurion University had set aside \$18,000 for loans to students who had difficulties paying tuition fees and the levy but so far the students had not made use of these loans.

Israeli students now pay \$570 tuition per annum and next year will have to add to this the \$300 levy.

Poland upset by Germany's use of old place names

West Germany must revise its textbooks and atlases if it wants an increase in student relations with Poland, according to the Polish government press spokesman Jerzy Urban.

Rejecting an offer from Chancellor Kohl of holidays for Polish students and young people in West Germany, Urban said there was no need for it.

Young Poles were already fully assured of vacations in Poland, Czechoslovakia and East Germany, while a wide cross-section of the younger generation would be participating in the Moscow Youth Festival.

Furthermore, said Urban, the Polish government considered that student and youth exchanges must be "rooted in the state of Polish-West German relations". So long as West German textbooks contained "revisionist cartography and place-names", exchanges could not be extended.

In other words, if West German students want to have closer contact

with their Polish counterparts, they must learn to say "Wroclaw" not "Breslau", "Poznan" not "Posen", "Gdansk" not "Danzig". West German educationists, according to Urban, must work out recommendations for textbook writers, jointly with their Polish counterparts.

Urban also said progress on youth and student exchanges could not take place while young West Germans took part in the activities of what he described as "regional fraternity organizations".

The organizations in question are associations of Germans who, before the 1945 boundary changes, lived in areas now included in Poland.

To the majority of West Germans, such organizations have minimal political significance, and the West German government is officially committed to the 1945 Polish frontier both by its own bilateral agreement with the Polish People's Republic and by the Helsinki Final Act.

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Courses lengthen as loan curbs hit Finland's working students

from Donald Field

HELSINKI

Finland is following its Nordic neighbours Denmark, Norway and Sweden with growing claims that the volume of state-guaranteed students' finance is woefully inadequate. Existing scales are blamed for the lengthening, by as much as two years, of the time taken over bachelor's degree courses or their equivalent.

At present student's loan comes to 1290 Finnish marks a month (€155). It is topped by an outright 200 mark (€24) grant. After five years the recipient has to repay an annual 12,349 marks

(€1,488). Even against a strong pound, the cost of living in Finland is probably 30-40 per cent above British levels.

More and more, the fear is being expressed that students will have to turn to their parents for support, effectively discriminating against less well-off families. This would jar with the tradition of student independence, partly attained by vacation and evening jobs.

Students suffered a big set-back in 1976 when a 30 per cent cut in the real value of student support was introduced as part of the government's austerity programme. Unlike other

items of public expenditure, the money taken away from students has still not been restored.

According to calculations made by two official bodies, the University Council and the Economic Planning Centre, the burden on students could be substantially reduced by a sum equivalent to 0.1 per cent of the central government's budget, in which education as a whole has a 15.6 per cent share.

Four alternatives outlined would raise total student support to 1,862 marks (€234) a month - the level officially deemed sufficient. The

alternative diverging most from the present system would combine an outright grant equal to basic unemployment benefit (1,540 marks, €186) topped by a small loan. This would leave the recipient with only 16,613 marks (€2,001) to repay.

By contrast, another alternative would raise the loan share in support from the present 85 per cent to 89 per cent. Repayments would rise to an awesome 82,656 marks (€9,959), all in the space of only five years.

Other proposals would gear student money to what is viewed as subsistence levels for food and personal outlays,

and to government-financed sick pay. The aim would be a less sporadic approach to study, with fewer disruptions caused by working part-time.

This would induce better academic results in the universities, and shorten the time spent over a degree.

The Centre-Left government, however, has decided that student support for the next academic year - loan and grants combined - will rise by no more than the inflation rate, to 17,415 marks (€2,101).

There is also a means test. Assessments are made on the basis of parents' income if the student has not left home

Measuring by degrees on the performometer

Performance indicators have arrived. Everyone in higher education may think they are a mere twinkle in a ministerial eye. But in fact they have been working for over a year, in the transitory database at Brighton Polytechnic.

The Brighton database is the 1980s equivalent of one man and a dog: two men and a computer. It is funded by the Council for National Academic Awards, but it contains equal (and comparable) data for the universities as well as the public sector. At present it covers two areas: first degree classifications, and first destinations of graduates.

It is run by Brighton Polytechnic economics lecturer Tom Bourner. He became interested in the accessibility of higher education performance statistics after he tried to find out what happened to economics students after they graduated. The work involved took him over a week.

He talked about his interest with the CNAAs: they commissioned the database including two other major studies with £40,000 over two years, starting in January 1984, although the work is likely to be extended.

The material it contains comes almost entirely from published sources: university and polytechnic careers services; the University Statistical Record; CNAAs records and the Govern-

Karen Gold visits the database at Brighton Polytechnic already hard at work on performance indicators

ment's further education statistical record.

But Mr Bourner and project officer Mahmoud Hamed have organized that information so it is accessible in a form of interest to institutions, course and department heads—and outsiders who want to know how results at a particular institution in a particular subject rate for quality or employability against the national average.

The database classifies 40 subjects so they are comparable across the binary line. (It excludes the Open University). On first degree classifications it holds data from 1971 to 1983; on first destinations from 1975. Both will be updated annually.

The CNAAs has published an introductory two booklets. The first destinations data available includes comparisons of destinations from different subjects and subject groups and the overall national picture; comparisons over a period of years to show trends, and league tables of graduates in different subjects going to particular

destinations (jobs, further education, unemployment etc).

The first degree classification compares results in one subject with a wider subject group and an average; shows results for a different period revealing trends, and again a league table of subjects whose graduates gain most and least first or upper second class degrees.

Obviously institutions' results will vary from year to year, and there may be good reasons why particular results are a long way from the average. The averages can be divided or combined for the universities and the public sector, with the degree results tables probably making more sense for individual comparisons if they are divided. The point is, says Mr Bourner, that if an institution's results are regularly widely different from the norm and there is no clear explanation, then some questions must be asked.

So far more than 100 people have paid between £4 and £8 to use the database. It is geared towards

people in institutions or CNAAs boards wanting to compare results for individual courses with a national mean. But outsiders use it too, and will increasingly do so as it becomes better known. Not long after he started, Mr Bourner received a visit from a man from the Institute of Electrical Engineers, who went away with a bundle of statistics he had previously spent weeks trying to track down.

Performance indicators featured in the Government's Green Paper on the development of higher education as a way of monitoring universities. The National Advisory Body is on record as wanting institutions to monitor graduate employment to compare their performance with the national picture. The NAB said one year ago that the Department of Education and Science and the careers advisory services should provide information on longer term employment trends. Mr Bourner said: "They haven't. But we have."

CNAAs Development Services Publications 3 and 4 on first degree classification and graduates first destinations, available from the CNAAs, 144-154 Gray's Inn Road, London WC1R 8BP. Manuscript data forms to CNAAs Project Development Officer, Computer Centre, Brighton Polytechnic, Watts Building, Moulsecomb, Brighton.

A theme among the variations

Does it work? That is the question to be answered about the database, before course leaders and department heads start to compare the results with the averages regularly.

Clearly many caveats are necessary. Individual years will always produce anomalies. Averages can be so average as to be almost meaningless, not only to institutions a long way below them but also to institutions a long way above.

The TIMES has obtained results for one year (1982) from universities and polytechnics. Collecting that is the subject classification itself, and the difficulty of fitting the results into the categories. There are many problems with the data, but the results show very clearly that the pattern closely reflects the reality. Electrical engineering in universities, averaged over 1982, was 12.5 per cent of upper second class.

In individual universities it varied substantially from 19 per cent to 2 per cent, but were clustered between 9 and 14 per cent.

In university biology courses 46.8 per cent of students in 1976-82 got "good degrees": again the variation is substantial, from 17 to 70 per cent, and again there are clusters.

The relationship within each institution between subjects also reflects the national pattern: institutions submitting figures for three or four subjects showed a very definite pattern of higher numbers of firsts and upper seconds in engineering (usually the highest); moving down through biology and English, to sociology at the bottom. That pattern existed even where the actual numbers were not very close to the averages produced by the database.

The percentage of "good" degrees in polytechnics was generally lower than that in universities, although not always. Some produced surprising results: Hatfield, for example, generally thought of as the ultimate in techno-poly, produced substantially better than average results in English, sociology and biology, but not in electrical and electronic engineering. The Polytechnic of North London's much-maligned department of sociology and applied social studies gain better than average CNAAs degree results: more firsts than average and many more upper seconds in applied social studies.

PRIVILEGE

Jon Turney meets Francis Crick of DNA and double helix fame who, now approaching 70, is alive and well and having lots of fun in California.



but puts forward ideas which rob the nocturnal images we remember of any meaning. By this argument the dreams which stay in the mind are aberrations, failures to encode nonsense messages in an information processing system. It is this treatment of problems which have wide popular resonance—the origin of life, the nature of inheritance, consciousness, dreaming—in what Crick regards as a properly scientific spirit which makes one believe the feeling he describes in *Life itself*, that a modern scientist lives in a different culture.

In some ways, he now finds it easier to find common ground in chance encounters. He recalls how 20 years ago you could go to a party in Cambridge and talk to a perfectly intelligent person who didn't even know the sun was a star. "That happens less often now, but it is still hard to put across the thinking behind work in progress, especially work on the brain where we have many problems and few solutions."

'We just don't have detailed answers'

On a more philosophical level, he now takes a long view. "If you want to establish the truth, idealism is wrong, for example, it's not going to be done in a short time—there will be many tens of years of work." Even in molecular biology, the reductionist approach is not completely secure, though there is every reason to be confident. "We can see how powerful it is to have genes producing proteins and proteins interacting... but we couldn't answer someone who was extremely sceptical because we just don't have detailed answers. We couldn't say how you build a hand."

But again, the difference in looking at the brain is that we do not yet see how such a problem could be answered. As Crick puts it, we have not yet found the right idiom for solving problems of brain function.

How complex facilities like vision are. And even if there are hints about how to solve problems of vision for machines, they do not look to Crick as though they are going to be the same as the solutions which have evolved inside the head, "any more than the flight of aeroplanes is exactly like the flight of birds."

If the hope of progress in brain research stretches far into the future, Crick's own scientific life clearly cannot. But he intends to remain active in the field for a while yet. He gives the impression of preparing to grow old, but he is certainly not ready yet. And while he is prepared to debate the merits of returning to London when he finally retires, perhaps to write a book on the brain, he also avows that he and his artist wife Odile now feel like natives in California.

His career has spanned an extraordinary era in biology. The science obsessed Mill Hill schoolboy who began work as a physicist before the war can now look back on a string of remarkable successes in unravelling the intimate workings of the cell. Along the way, he acquired a Nobel prize, for the solution of the double helix with which his name will always be linked, and a kind of celebrity. (He states with a grin how he did not have the heart to tell the Cambridge publican who showed him the helical plate frame in his garden that he had built a wrong-handed helix.)

Yet for all the changes the last 40 years have seen, his own pattern of work has remained unusually stable. He has taught little, and never directed a large-scale research. He declares himself allergic to committees, and turned down a couple of Cambridge masterhips because they involved all the things he did not like. In a way, it has been an indulgent life, talking, reading and writing—and Crick can talk on a sparkling variety of subjects. But the indulgence has always been underpinned by a fecundity of ideas and intellectual rest rarely matched in any field. No doubt the luminosity of Crick's intelligence has dimmed somewhat since he first started to exercise his talent for solving problems of biological gadgetry. But that seems no reason to stop work altogether. Asked to describe his role in neurobiology today, he laughs and recommends asking others how they see him. "My point of view is that I'm having a good time."

What really determines the results

For anyone emerging from a mountain of exam scripts, mark charts, correspondence with external examiners and candidate angst, this could be an unwelcome surprise.

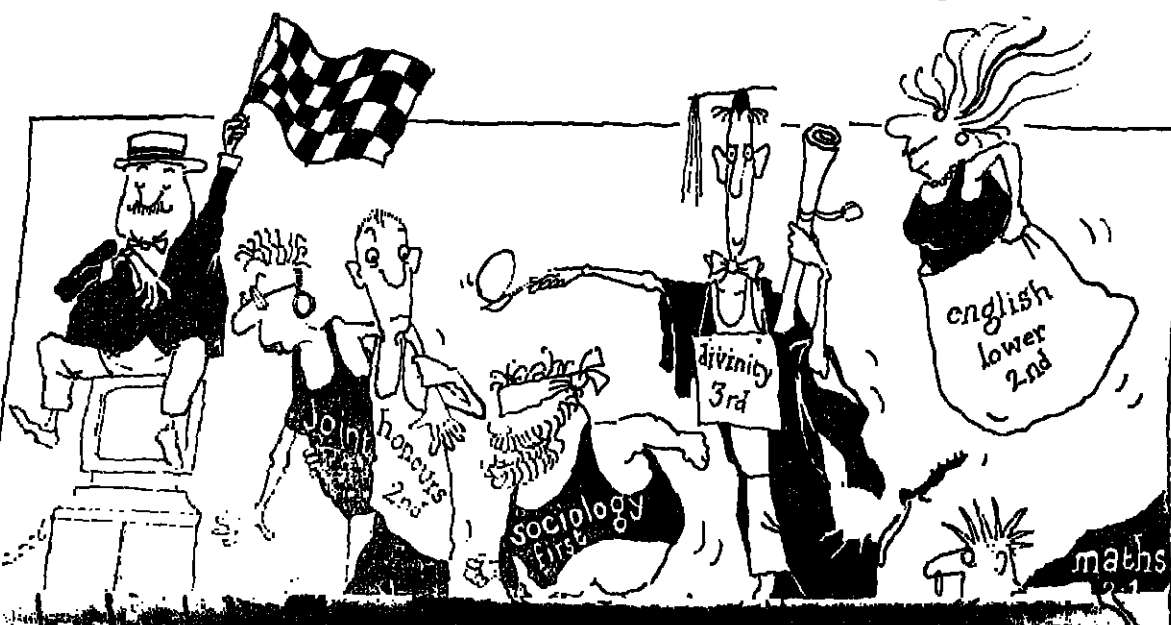
The greatest influence on the distribution of this year's degree results—firsts, upper seconds etc.—will be not the teaching, not the candidates' abilities nor even the shrinking unit of resource. It will be the distribution of last year's degree results.

The transitory database at Brighton, as well as providing a reference point for individual departments to check their comparative national figures, is also informative about the performance of the whole. The areas is the difference in degree results across subjects.

The database has produced tables revealing that at both the universities and public sector, degree candidates in one subject are ten or more times as likely to get a first as in others. Of art and design students taking CNAAs degrees 11.4 per cent comes out with first compared with 0.7 per cent of those taking law. Nineteen per cent of university maths, statistics, or computing graduates come out with firsts, compared with 1.9 per cent of those taking government and public administration.

Percentages of those getting "good" degrees—firsts or upper seconds vary almost as widely: 55.5 per cent of CNAAs industrial production engineering degrees; 16.4 per cent of CNAAs law degrees. In university drama performing arts degrees 54 per cent; 29.6 per cent in university accountancy degrees.

That huge gap between subjects raises the question what is "a degree" if the scale of achievement varies so



widely? It is arguable that all this shows is that the whole business is a lottery; that external examiners—who are guarantors of standards within but not across subjects—are not working; that some subjects are "easier" than others, and therefore the reasons for differences cannot be analysed.

Tom Bourner has chosen to say that the external examiner system does provide consistency within subjects, and that therefore some of the reasons for difference can be explored. He has done so in a paper for the CNAAs, using a statistical method called regression analysis, looking in turn at a series of factors that might influence degree results.

Mr Bourner examines seven possible factors, emphasizing that both ideas and conclusions are tentative and preliminary. The first is the idea of "subject maturity".

Newer subjects at degree level—

such as social science or accounting—may be taught and examined by younger, tougher and less academically confident staff, he suggests, who are still having to prove their subject's academic eligibility. The subjects themselves may also be less well developed. Hence one might expect a lower proportion of "good" degrees, and in particular of firsts.

The next five he chose were less likely to show the same effect across the university and public sectors, since they were unevenly distributed between them. They were: the proportion of non-honours degrees awarded (since more of these might cut out candidates who could otherwise get thirds and bring down the overall scores in honours programmes); A level results; the proportion of non-standard entrants; the numbers of part-time and sandwich course students; and the resources devoted to individuals and subjects.

The final factor was the idea that particular proportions of different degree classes were awarded simply because that was the way the degree class cake in each subject had always been divided—something Bourner calls subject norm referencing.

He calculated this by looking for two relationships. One between the proportion of "good" degrees in universities in 1971-75 and those in CNAAs subjects from 1976-80. That was predictable because of university staff's involvement in CNAAs validation. But there was also a relationship between 1971-75 CNAAs results and 1976-80 university results. That "could" be explained? A history graduate (49 per cent get "good" degrees) or an economics graduate (32 per cent)?

Students with different subject backgrounds compete with each other for the same jobs. Large accountancy firms recruiting graduates with "good" degrees are choosing from philosophy graduates (48 per cent get firsts or upper seconds) as well as accounting graduates (27 per cent with first or upper seconds). That kind of difference cannot surely be explained by saying philosophy graduates are better, or that philosophy is an easier subject than accountancy.

On the other hand there is a strong relationship between non-standard en-

try students in the public sector only and first class degrees. As expected, part-time students gain fewer firsts than full-time ones, while sandwich students increase the number of good degrees in the public sector. In both sectors a higher finding per student is once. Considering that this calculation was done on a not quite comparable data, Mr Bourner says, the result is surprisingly statistically strong.

But above all these factors comes the subject norm referencing. There are other variables that might be included in the analysis, and Mr Bourner wants to try some in the future, including previous study of the subject; type of A level teaching (e.g. classical sixth form); subject mix; ratios—but none has the statistical significance.

It means there is a lot of agreement perhaps, unconsciously, about what the subject's results should be, no matter what the each year's results. The subject norm should be the same number in previous years. Obviously there will be individual variations—the study below looks at some of them—but the overall effect is the same.

Mr Bourner calls it a disturbing result. "It's believed that we don't have norm referencing. I am suggesting that we do. The fact that it is restricted within and not across subject boundaries makes it more rather than less worrying, he says."

Non-specific postgraduate awards are given according to degree class: who is more qualified for an MBA, for example? A history graduate (49 per cent get "good" degrees) or an economics graduate (32 per cent)?

Students with different subject backgrounds compete with each other for the same jobs. Large accountancy firms recruiting graduates with "good" degrees are choosing from philosophy graduates (48 per cent get firsts or upper seconds) as well as accounting graduates (27 per cent with first or upper seconds). That kind of difference cannot surely be explained by saying philosophy graduates are better, or that philosophy is an easier subject than accountancy.

On the other hand there is a strong relationship between non-standard en-

Still deep in the business of science

The Crick you may meet on one of his annual summer visits to Cambridge is not the cartoon Crick of Watson's stylized memoir *The Double Helix*, with its famous opening: "I have never seen Francis Crick in a modest mood." Nor is the reminiscent Crick the historical figure, who fills page after page of Judson's book with incisive quotes about the way it was—in the days of the DNA discovery, unravelling the genetic code, or piecing together the mechanism of protein synthesis. It is a Crick still deep in the business of science, and eager to talk about the field which now fills his thoughts.

And a remarkably complex field it is. The few pounds weight of grey matter in our heads contains around one hundred thousand million neurons—the building blocks of the nervous system. And each neuron is linked to as many as ten thousand others, and influences them through a combination of chemical and electrical signals. Although the system's speed of operation at the level of cellular messages is slow compared with human-built computers, its richness of interconnection still makes a myriad of tasks which

leave computers looking stupid so simple for us we rarely realize how remarkable they are—seeing, hearing, speaking or listening all remain essentially mysterious.

But of course Crick's attitude to neurobiology is shaped by his deep knowledge of molecular biology, as well as being influenced by the same underlying metaphysical conviction. His own focus is on the visual system, partly because it is the subject of a long tradition of work in the field, partly because he has a sense it may be possible to make progress here. And Crick is not especially interested in "black box" descriptions of vision, or in whether it can be successfully modelled with some electronic device—he wants to know how it actually works in the brain; "you have to think in a very different way—once you've got away from the idea that there's someone inside your head looking at what's going on. You have to explain how it is that you perceive things is all done by neurons firing. It's a very, very strange thing."

You can hear the molecular biologist talking when he describes others working on the same problems, feeling that many of them, especially if they have come from physics or mathematics, have no idea what a biological system is like. "They know in principle it evolves through natural selection, but they don't know what sort of things you tend to get in biological systems."

Crick thinks he does. And he is dubious about the search for very general algorithms to account for feats like vision, which many researchers seek under the influence of ideas from computer science. "It doesn't look like that to me. It looks like a lot of little devices, and bits of gadgetry which are put together and all interact together in fancy ways." If this sounds skin to the picture of the cell built up in the 1960s, it could as well describe the intricate designs for mines, detectors, and devices to fool the detectors which Crick dreamed up in the war years.

Another perception of the field is also coloured by the spectacular progress of studies of genes and proteins. In much of neurobiology, especially studies of cognitive processes, he finds, "there's no one with any real experi-

ence of success. They hardly know what it is to discover anything—it's very peculiar."

But if he is modest about the field as a whole, he also deprecates his own contribution, pointing out that it would be foolish to expect to go into new areas at 60 and overturn it. And he has high standards on what counts as a genuine contribution. "A striking success has to be something which the people in the field initially won't believe... because if it's so common-place that it's obvious, why do you have to have a theorist to tell you?"

On this criterion, the verdict is still open on his own most recent piece of sustained work, on how the brain fires on small regions of the visual field in turn to keep track of the big picture—the problem of visual attention.

Keeping track of the searchlight

A sequence of eye movements in series accounts for part of the scanning process, but there is also evidence for a further serial scanning within the brain itself. This trick, christened the searchlight by the psychologist Anne Treisman, is described by Crick in a paper published last year: "The searchlight is not supposed to light up one of a completely dark landscape, but, like a searchlight at dusk, it intensifies part of a scene that is already visible to some extent."

Characteristically, Crick argues that the natural question to ask is where this could be going on in the brain. And he has suggested that what is known of the properties of groups of neurons in the thalamus fits them to control the searchlight—amplifying the inputs received in small regions of visual cortex, one at a time.

But it has proved a hard theory to devise tests for, and Crick himself is not equipped to do experiments at the Salk by his own choice. He hopes his hypothesis will prove correct, but it does not seem to have mobilized many experimenters eager to take up the

In September The Times Higher Education Supplement

published a 4-page analysis of the joint statement from the University Grants Committee and the National Advisory Body regarding the basis for considering the present and future role of higher education in our society.

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(09)

Pauline Stafford

A year's wait for Domesday on a floppy disc

A note came through my door the other day reminding me of a promise to give a paper at a Domesday Colloquium in 1986 – another summer task before I leave for the warm south. Next year is the 900th anniversary of King William's decision to have a survey made of his newly conquered land, and know exactly what he had acquired in the surprise victory of 1066. It will be marked by a flurry of publications and colloquia. The main event of the year will be the Royal Historical Society's conference which, coupled with other events and 'satellites', will broaden the spectrum of topic and opinion.

The celebrations recall the 800th anniversary in 1886. But in 1986 the BBC's decision to produce a sort of updated Domesday will spread information wider than ever before. The 'new Domesday' – a factual and visual survey of Britain in 1986 – will be compiled, like the original, from information collected by individuals on the spot. Unlike the original it will be recorded, not on labourious manuscript or vellum but on floppy discs for use with the little micro.

Would William have envied us the detail and the facilities of this modern survey? Probably not. He would have been amazed by the overworked Winchester clerks who wrote out the original Domesday Book. But given the rather haphazard 11th-century attitude towards record-keeping it is as well that technology inhibited their efforts. If Domesday Book had been recorded on floppy discs it would have been created long before the 12th century was out, to be replaced by Dungeons and Dragons – a war simulation exercise.

Domesday studies could be taken as a barometer of the state of historical studies. My colleagues might envy at that statement, but once we have abandoned such areas we have ceased to be interested in historical study as opposed to modern politics. The great survey is one of the most famous of English historical documents, one of the few of which the woman in the street has normally heard. The popular grasp of its content is certainly hazy, though the BBC project alone indicates the continuing general awareness. The gap between the two general awarenesses and the detailed topics which will be written on and spoken of in 1986 indicates the problems and dilemmas of those who advocate a more popular history.

The expression of late 20th-century interest in the survey through the medium of the computer is inevitable. It is obvious not only in the nationwide attempt to update Domesday but in its scholarship, most notably in the research on Domesday pioneered by the Department of History at Hull.

Nor is it merely in the technology of the survey that attitudes towards and understanding of the survey are changing. Although there is an obvious continuity between Domesday studies over the last century and a continuity of historical development, there are also significant differences in the questions and concepts now applied to the survey, indicating that the dialogue between past and present is still continuing.

As in 1886 many of the papers

promised for 1986 will be concerned with the way the survey was made, with its relationship to systems of taxation and assessment, with the manuscript itself and the details of how and where it was written. Others will depart radically from the late 19th-century agenda – concerned with this first survey of England as a source for social structure, for the history of women, changing patterns of wealth and other new possibilities which the computer has opened up.

Domesday appears to signal a healthy state for historical study, a necessary balance between what would appear to the popular view as the irrelevant minutiae – without which all study of the survey would grind to a halt – and those questions which preoccupy the late 20th century. Inevitably administrative concerns still predominate. Domesday Book must always be seen in the context of administrative history, whether we look on it as the first record of English bureaucracy or a vast administrative mistake. But if administration was the central issue in the late 19th-century dialogue, its primacy is less defensible now.

Although historians are clearly open to contemporary debates, that openness appears to be limited. It is a limitation fostered partly by a century of professionalization, which can limit the financial and other pressures which higher education have played their part in restricting it. But the very threat which has generated these pressures makes the removal of these limitations imperative.

The use of the computer is an important advance in the study of a survey full of statistics. Historians are not fighting shy of the potential of this new tool of research. But information technology must be a tool not a replacement of, and certainly no substitute for, their other skills. The formulation of the questions and the refinement of the concepts with which the source is approached are still the products of historical training, and it is here that the major advances in understanding occur. The capacity to formulate questions and handle concepts is still one of the products of humanities education which it cannot substitute.

Beyond statistics, overall understanding of the nature and purpose of the survey within its own society is a herculean problem which is the proper function of the humanities. Such questions take us beyond the adding up of tax assessments and population sizes.

Some historians in 1986 will see the survey as the product of a misplaced desire for knowledge, the production of a body of information which once assembled proved foreign to contemporary systems of thought and analysis. A body of facts and figures quickly became an object of myth and legend. Others may point out that the survey may be not so much the foundation of administrative bureaucracy as a demonstration of royal power, a royal progress by proxy in which the populace became aware of the omnipresence of royal authority which recalled this day of judgement itself.

Such insights flow from historical understanding. If we find such habits of thought strange, if they confront us with a need to re-examine our 'common-sense' attitudes to facts, figures, government, that is a sign that history is doing its job properly – though that is another story (or another column).

Above: an anaerobic incubator used to test the ability of plants to withstand periods of oxygen deprivation.

Above right: this bulrush rhizome kept for two weeks in the anaerobic incubator produced a new shoot in total absence of oxygen.

Right: venue for the physiological ecology conference, the new Sir Harold Mitchell building of the Department of Plant Biology and Ecology of the University of St Andrews.

Seeding the wetlands to feed the world

Amphibious is not a word that is usually associated with plants yet there are many species of higher plants that have to adjust suddenly from a dryland to an aquatic existence. When soils flood, or the water level rises, remaining oxygen dissolved in the soil is used up in 24 hours so that the root environment rapidly becomes oxygen-deficient. If the leaves are also submerged this can deprive the plants of light and carbon dioxide for photosynthesis.

The problems encountered by both crop and wild plants under these conditions formed the basis of the international meeting at St Andrews.

It is perhaps appropriate that Scotland with its reputation for rain and bogs should be a venue for those interested in the effects of flooding. What is perhaps surprising is the extent of interest in flooding that now exists even in arid countries. The increasing use of irrigation creates problems of temporary water-logging for crops that would normally never be flooded. Furthermore, in arid countries irrigation leads to accumulation of salt in the upper soil levels. Even the survival of supposedly flood-tolerant plants such as rice can be adversely affected by flooding at the wrong stage in their development.

Most crops undergo considerable reductions in yield when flooded and even when flooding lasts only a few days the harvest can be much reduced. Despite this lack of tolerance in cultivated plants, wetland soils and marshes have natural vegetation that can be productive. Instead of overcoming the problems by draining, more attention should perhaps be paid to adapting crops to withstand the dangers.

Crop breeding has produced varieties of plants to suit varying lengths of growing seasons and temperatures, and it would be just as feasible to replace the habit of adapting the environment to suit the crop with the development of crops that suit the environment. This approach would not only tap the wetlands' enormous production potential but would also save those areas of Britain threatened by drainage, realized: how frequently plant species suffer from oxygen shortages or how strong some species are to survive such stresses. Germinating seeds have a period of natural oxygen shortage as their metabolic activities before the seed coat is ruptured. Normally the oxygen shortage is short-lived and has no adverse effect on germination. If it is prolonged due to wet, cold weather both the emergence and growth of

The study of the ecology and flooding tolerance of swamp and marsh plants can have useful applications in agriculture and food technology. The physiological ecology of amphibious and intertidal plants, considered by an international meeting held recently at the University of St Andrews, the meeting brought together nearly 100 plant scientists from Australia, Canada, USSR, Switzerland, Denmark, Italy, Sweden, Austria and Holland to share thoughts on the ecological problems of the developed countries and the Third World. R. M. CRAWFORD reports.

many crops will be severely limited. Peas and barley are two crops where soaking injury in poor springs can have disastrous results. The St Andrews group has recently studied a number of long-established barley varieties from Finland, where late springs are a constant hazard. The tolerance of oxygen deprivation under the low temperature conditions that prevail in spring varied from three to four days to two weeks. Such a variation can make all the difference between success and failure in producing a good crop.

Some of the new fast-growing varieties of rice are adversely affected by monsoon weather. Farmers are aware of the risks of these high-yielding crops. They lack the natural tolerance of anoxia (oxygen deprivation) found in older slow-growing and less productive forms.

Flooding also causes problems for forests. Regeneration of the bottomland trees of low-lying wetlands in the southern United States is dependent on intermittent drought years that occur only a few times each century. In Britain, premature wind-throw is one of the severest financial losses to forestry, particularly in the north where large forests are planted on ground is wet and exposed.

The large acreage of Sitka spruce planted in this country is particularly vulnerable to the effects of non-flood-tolerant trees. Sitka spruce does not provide a suitable shelter for mature trees, and the loss of Sitka spruce could become unstable due to inadequate tree development in 10 or 15 years' time resulting in massive destruction of our forests from wind-throw. Again it is difficult to avoid this damage by providing further drainage. Selection of flood-tolerant trees could however provide a solution.

Due to the greater resource allocation to roots in such trees, timber growth would be slower and it is understandable that initially such trees may not be attractive to foresters. As flood-tolerant trees could eventually support larger trunks, the increased volume of timber they could provide should be seen as a benefit. Such a change in policy would produce cash

flow problems for forests. It would eventually help to achieve a greater timber carrying potential in our forests as well as having enormous aesthetic and ecological advantages.

The natural ageing process of many fruits and vegetables can be delayed by artificially increasing the degree of oxygen deprivation. This is already partially achieved commonly. Thus, the use of high carbon dioxide stored under plastic film so that they do not ripen too fast in the market in top may be thought of in this way.

Although the apples may survive the period of oxygen shortage undamaged, some varieties begin to deteriorate when returned to air on their way to market. This deterioration can be prevented by spraying fruit with antioxidants, a common practice with apples and bananas. Public opinion is growing against the chemical treatment of our food with artificial preservatives. If varieties could be found that survived both anoxia and the post-anoxic return to air without any deterioration this pollution of our food would not be necessary.

Much has been learnt about the growth of plants in lakes, and the degree of specialization in those from different depths. Although submerged plants are protected from the usual climatic stresses that control the distribution of terrestrial plants, they are highly variable. Some species are restricted to using dissolved carbon dioxide while others also use the bicarbonate ions abundant in some lakes. The variation in light at different depths and its effect on leaf development is closely related to survival under water.

An understanding of amphibious plants and their adaptations can improve both agriculture and food technology. These studies exploring the million-year-old experiments of evolution can provide us with information and practical suggestions for our own survival.

The author is professor in the department of plant biology and ecology at the University of St Andrews.

Socialism started out as a moral criticism of the most repulsive aspects of capitalism. At that stage – let us say, by the end of the first quarter of the 19th century – capitalism certainly had its economic defenders, but hardly its moral ones.

Adam Smith and the Edinburgh economists were boundlessly impressed by the sheerly abundant power of this new triad of production, ownership and exchange, as well they might be, but insofar as they addressed themselves to its unpleasant effects, they either accepted these as the natural expressions of human nature, some of whose embodiments were bound to behave badly out of inherent boisterousness or dependency, or they allowed that things would get better as the whole system became better understood and handled. Bentham hardly troubled himself about the essence and energy of the structure which created mass industrial society. He was, strikingly, the first to see and grasp that acute misery was remediable, and to propose means of imagining and organizing amounts of such remediation. He remains indispensable to socialists, but he had notoriously no picture of the good life, nor any moral criticism of the way of a world which brought people to such a pass.

Not until revolutionaries and reformers began to argue across the Channel on the way to the insurrections of 1848 did a vocabulary emerge capable of mounting a coherent moral critique of a way of running things only recently recognized as a social system and not a natural order, and therefore open to change. After Proudhon and St Simon, Blanqui, after Cobbett and Hunt, Owen; after these beginnings, Marx; after Marx, Morris. The moral line of socialist theory lies there.

But however much any human community needs its ancestors and its great heroes, the history of ideas has only limited application. It may tell you how you got yourself into this mess in the first place. It can't tell you what to do about it now.



Jeremy Bentham: the arithmetic of happiness

So it is with the moral language of socialism. Both revolutionaries and reformers, according to that antique division of political labour, had a powerful story to tell about what and whom to resist. The future, helped towards the present tense with a little timely violence, would deliver the good life. In the non-socialist West, the failure of the future to appear has left the left, with the exception of those deranged optimists still planning a revolution from the Cortes theatre or other less promising venues, preoccupied with defensive politics. Such a culture is, as Edward Thompson has noted, densely and doggedly oppositional "because there has been so bloody much to oppose." In socialist Europe, the unlooked-for but opportunistic taken access to power by radical Communist parties eradicated the moral vocabulary overnight. Consolidating their grip in the deep freeze of the cold war endorsed Stalinism everywhere east of the Oder-Neisse line. Power without values held down the Iron Curtain. When it was opposed, as the names of Nagy and Dubcek bear grim witness, it was only by a helpless nobility.

Such reminiscence give rise to a political formula: power without values is inversely symmetrical to morality without strategy. Socialism has been held in this limbo.

Saying so is hardly more than a banality. Both halves of the formula however generate the political energy they do because of the vengeful and belittled nature of the enemy. That complicated political formation which we may clumsily designate bourgeois (and later, monopoly) capitalism has always proved murderously bent on retaining its power, privilege and wealth. Lenin and Stalin learned this deep and bitter truth in the civil war and after; the First Secretary knows it

Socialism and the good life



Fred Inglis asks what bearing a historically derived secular morality can have on the way people actually live

today. Some such historical truism is one explanation for the monolithic nature of Soviet bureaucracies. By the inverse token, the moral criticism of capitalism's cruelty, waste, indifference, and rapacious greed remains piercingly accurate even in politics with no interest at all in constructing a

morality form and content, and however odd a mixture such an attempt may yield of, say, Twain's Christian socialism, Kantian deontology, bits of Kropotkin's ethics, Morris's and Ruskin's aesthetics, Orwell's sympathies and so forth, it is clearly true that socialism considered as a tidy set of our best moral intuitions is in the right (moral) assessment of ideals for even the young men and women to admire and follow, and is not going to be dissolved by the corrosions of cynicism, or consumer life, or even local party phillistinism.

The continuing glow of these ideals is made particularly visible in the darkness at the heart of present versions of Toryism or other right-wing politics, in western Europe or the United States. In the home parish Mrs Thatcher's invocation of Victorian values has not only bounced back at her in a wide-eyed and revolted recollection of what are well known to have been the facts of family and factory life in the pages of Mayhew and Mrs Gaskell, but also will hardly serve the rhetorical purpose to which she presumably intended they should be put. The great Dickensian values of mutualism (among thieves, harlots and outcasts), compassion (for escaped convicts), passionate resistance to official lying (of state legal systems) have been rediscovered and recreated quite without sanctimony by 140,000 striking miners and their families throughout 1984. Much more straightforwardly, the emetic chorus of nationalism which rose in American gorges at Reagan's re-election – "walking tall" and all that disgusting cliché-douche – is plainly accompanied by arrogant lying about deficit economics and brutal gangsterdom in their imperial manoeuvres in Central America. The moral condemnation of what are, in the grisly jargon, called postures is, even if inefficient, irrefutable.

The only secular moral vocabulary is presently, the socialist one. No doubt the critiques of capitalism from both Islam and Christianity will need to be more heeded by socialists but for these general purposes – of both resistance and recreation – may be thought of as joining common cause with secular politics. The new right had had to lie itself into a state of caliginous rigidity. In the case of Lord Hayek, it had done

so in order to sustain a devastatingly selective and unreal theorization of the desirability of capitalist freedoms. In the case of Mrs Thatcher, it has done so merely for the acquisition of a power now wielded with a stupidity and stubbornness which will guarantee its own end. In the case of its ideologues such as Professor Vincent or Dr

colleges, require, among much else, a moral argument for their regulation. But the viciousness of discourse on can simply move in to capture the public has bloodily overdrawn its moral account. There is a very wide gap between where people truly are living and valuing their lives and those they love, and the purchase of the conventional master-symbols. Love itself, equality, dignity, solidarity, are filthy with dishonest use in public, and correspondingly difficult to utter. Indeed, one definition of social crisis is that such a gap exists between the unofficial and the public languages of valuing.

Any adequate picture of a socialist's good life must therefore find recognizable embodiment in the way people really live. Such a formulation at once sounds strained. Which people? We wonder, in a society so peculiar and stratified by class, colour, region, gen-

it be a fool. Immediately we feel caught between his proper realism and our sense that we ought to make the effort. In a reach-me-down way, we may improve a moral structure capable of identifying the difficulty by weighing up three leading factors. The first sorts the degree to which our integrity and self-respect is at stake in the

community the degree of what we may call "participatory evil" (ie: "Will someone else do it if you don't, and is it on the whole better than you do?") a question positively answered by horrible consequences by the Impresario in *Mephisto*). The third takes the measure of effectuality, and insists that we reckon up whether our action will make any difference (for example, in not buying South African goods).

This is only a preliminary move to describe how to come at decisions of a socialist kind which will connect the "valuing-space" of private lives with the polity: the line from politeness to politics. The much-contested examples around dinner tables in scrubbed pink kitchens are private education and private medical insurance; two much easier ones are, say, equal divisions of labour in organizing housework and the drastic correction of racism. In Britain, at least, health, education, and welfare have been the ground upon which real socialist advance has been made, in being thrown back, and must be renewed.

The examples are no more than that; they return us to the facts of life. But they serve also to remind us that values can only live in the social institutions which characterize a form of life. To say so runs strongly against the individualizing of value which liberalism so much insists upon. Without at all the left who have made "liberal" into a swearword, the socialist morality which grew out of deepening and extending the strong European commitment to private lives and values until their communal and co-operative bases are understood, reciprocated, and made more general. Schools, hospitals, and social security payments are so understood, though still so indignantly prodded. They are the institutions which carry the values.

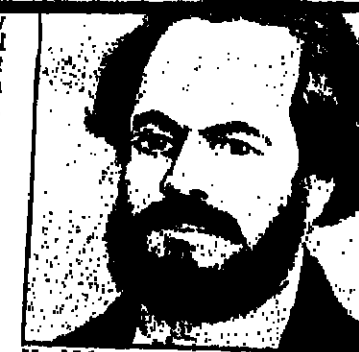
When, in an inevitably bitty and occasional way, we live the meanings of these institutions, as patient or nurse, as pupil or parent, the republic gains a little. To put it so is to push the argument beyond the notion of morality into the political organization of society. Bernard Williams has recently claimed that morality is itself too limited, too demanding, and too contradictory to live by, and proposes instead the provision of social institutions which make the notion of moral decision less absolute, and the coun-

terposed claims of voluntary motivation and blame less dominant.

I compress his case cruelly. But to speak in such terms is to shift the political argument on from the carring narrowness of disputes over rights which inevitably dominate an American political thought with no socialist tradition, towards an attempt to see freedom itself not as "dual" condition but as one of the virtues. Machiavelli, in Skinner's reading, doesn't identify agents as individuals with rights, but as peoples and cities. For him, *virtu libera* translates as "public spirit", and freedom is a way of life for the whole community. Egoism is not the queasy presence it is for Kantian romantics, an uneasy demon riding alongside the good of conscience. It is the destroyer of liberty. The law thus becomes the necessary means of freeing the people from the bondage of corrupt egoisms.

We cannot revive an antique city-state at this juncture, nor combine Machiavelli with John Stuart Mill. But socialists would do better with the classicists as their reading if they wish to reconnect private and public lives in some larger and rounder picture of the good life as presently livable according to more civic and civil virtues than may be found in Threadneedle Street or at Molesey. Jokes pass about the Soviet republic of London or Sheffield. But it is not sentimental to claim that such dry-eyed institutions as Sheffield's flat-rate bus fare or the Greater London Enterprise Board reaffirm the republican virtues. Even the derided symbolism of nuclear-free zones re-establishes the notion of freedom from the presence of those beastly weapons as a condition of a common way of life, a public spirit.

There is much to build on. Perhaps there is also less need to descend upon the dangers of a statist imposition of hateful social institutions than a need to warn that if we do not have confidence in what Bernard Williams calls "thick concepts" in ethical behaviour – not just goodness and badness but more specific ones such as "courage", "truthfulness", "fidelity", "tenderness" – then any may disappear for a season from our social



Karl Marx: the calculus of revolution

life. Without the institution of blood donation as Titmuss pointed out, no gift relationship with strangers. Without peace monuments, no peacefulness. Without decent and honourable classrooms, little decency or honour.

The good life for socialists and their governments starts, as plain, blunt men and women insist it should, in the present and with the facts. It starts with a calendar of needs which will be met for all citizens. Such a calendar can be far more than a minimal welfare; may be abundant enough. When it runs up against the inevitable scarcity of what Hirsch calls "social goods", then both pricing, and allocation will have to intervene in the name of fairness. People may afford a Mercedes or a holiday cottage, but not both. But up to that point, shelter, food, transport, medicine, education may be generous and non-competitively allocated. Of course they will be disputed, at times bitterly; of course no calendar of needs can be final. Of course this and of course that.

But what is certain is that we daily live a mechanism of allocation according to need, and it is known to be brutal and inadequate. A good life for socialists starts from a sufficiently working definition of the common good, and argues it as it goes. The ethical commitment is coterminous with the political commitment ("confidence" is Williams's word), and requires for its realization the institutions which give bodily life to values. If we do not have forms of life which thus carry the fruits of the spirit – love, joy, peace, long-suffering, gentleness, truth – then, as I said, they will disappear, and socialism become strictly unthinkable.

The author is reader in education at the University of Bristol.

Why it's time for the Industrial

William Birch reflects on how the Green Paper could have achieved a more effective relationship between higher education and industry and (below) Edward G. Coll looks at it from an American point of view



AFTER THE GREEN PAPER

of the relationship between higher education and industry in a range of European countries and in Canada, the United States, Japan, Hong Kong and Singapore.

There is still a reluctance to interact closely with industry particularly, but not exclusively, in the older universities and most prevalent in Europe and Japan. Commonly, this reluctance is based on the fear of losing a proper sense of detachment and undermining the pursuit of basic research and pure academic study.

It appears to be overly simplistic: higher education is part of society and the defence of its necessary freedoms is likely to be achieved most effectively by showing a thoroughly responsible attitude towards the needs of society as well as scholarship, particularly when higher education is publicly financed.

There is evidence of governments taking an intrusive interest in academic policy prompted by adverse public perceptions of the role of higher education. But there are also important examples of extremely fruitful interaction through which both research and teaching have been enriched and in which there has been a clear respect on the part of industry for the proper concerns of academic autonomy.

It is believed, therefore, that higher education has much to gain, as well as much to offer, in developing more consciously its links with industry.

Three conditions for success are discussed. First, the balance between the pursuits of academic and what will be called "operational" values in higher education needs reexamining. Second, higher education generally and particularly institutions with an appropriate ethos should develop more consciously and deeply the interface with industry, commerce and the professions. Third, the structure of the system of higher education should be designed to assist towards achieving a more effective relationship.

Tension within higher education is

inevitable between the pure academic tradition and the operational tradition, namely that concerned with the solution of problems which are of significance within the world of affairs. The term "operational" is preferred to the terms "applied" and "vocational" which have acquired lower-level intellectual connotations. The tension between these two traditions is healthy in the sense that it can assist towards the achievement of a balance between the pursuit of scholarly values for their own sake and their pursuit as a means to the direct improvement of society.

It is unfortunate that in Western Europe (with the partial exception of France) and in Japan, the creative benefits of such tension have been distorted by the emergence of deep-seated, status distinctions between academic and operational values.

A major concern of a number of European governments in seeking a reform of higher education has been to remedy this situation, though consistently with only limited success. However, in France, the example of *grandes écoles* coupled with the success of the relatively new *Universités de Technologie* has promoted a search by government for a greater "professionalization" of the universities, namely a greater concern with operational values in the face of rising student unemployment.

In the United States, the tension has generally been resolved more constructively than in Europe, not least because of the important contribution "schools" with their strongly established operational values. Correspondingly, the importance of these schools within many of the major universities, both public and private, is a reflection of the ethos arising from their founding. This applies particularly to the former land grant colleges and to institutions such as MIT and Stanford

whose founders had a clear sense of the notion later advanced by Whitehead, that "education is the art of the utilization of knowledge".

As Whitehead implies, the academic and operational approaches in higher education should be mutually reinforcing. Each should be concerned with the development of the mental qualities of the student through the teaching of the high level intellectual skills which are necessary in recognizing significant problems and subjecting them to rigorous theoretical and empirical analysis. It seems likely that a more explicit concern with problem-based learning could do much to secure a more balanced pursuit of academic and operational values in higher education. It could also do much to prepare students more effectively for success in their working lives.

The second conclusion, that higher education should develop more consciously and deeply its interface with the world of affairs, can be argued with reference to both teaching and research. The success of the sandwich study is, of course, an outstanding example in terms both of student motivation and the perceptions of employers. This approach is especially well suited to the needs of the student, and a close working relationship between the student and the institutions.

The success of such courses (and others in which problem-based project work takes the place of sandwich placements) emphasizes their educational value. It also reflects their ability to meet the concern of employers that students should achieve an integration of academic and operational values through an ability to address successfully significant problems in a way which is sound in both practical and theoretical terms.

In research, the over-valuation in higher education of pure research, commented on by Medawar and others, tends to promote a relatively closed system of concern with basic research and publication which feeds on both individual ambition for recognition and promotion and institutional concern for university research and therefore international recognition.

In its extreme form this set of attitudes is conducive to a positive aversion towards the application of knowledge through research into local and regional problems unless there are demonstrable gains for basic scholarship. Pragmatically, it becomes necessary, therefore, in considering the relationship between higher education and industry to explore the possibility that some institutions should be equipped and expected to work more closely than others with outside organizations.

The argument which is central to this article, namely that appropriate balance in research and teaching between academic and operational values is essential to the achievement of a more effective relationship between higher education and industry, raises important strategic planning issues in the British context.

A strategic planning body for higher education would be necessary, advisory to the Secretary of State for Education and Science. Its terms of reference and composition would need to be appropriate to assisting towards a deeper interface between higher education and society — appropriate, therefore, to strengthening public confidence in higher education and confidence within the system itself.

A significant proportion of the membership would comprise distinguished

men and women from industry, commerce and the professions (including the public service and the schools) who are thoroughly conversant with higher education. Such members would be appointed in their own right by the secretary of state; from among them someone fully conversant with both higher education and industry would be invited to hold the chair on a part-time basis.

Additional members would need to be appointed from higher education generally, from the University Grants Committee, the National Advisory Body and the research councils and from the Department of Education and Science, together with observers from the Department of Trade and Industry and the Department of Employment. Particularly important names would be:

- Assessing the nature and the scale of the demand for higher education in regard to both teaching and research;
- Rethinking and where necessary redefining institutional roles within a system;
- Setting levels of financial provision;
- Rethinking the career structure and reward system;
- Rethinking the relationship between the university and the public sector of the economy. It would be necessary to ensure that the high cost of ensuring that the role defined for this group of institutions could be discharged of itself, it is unlikely that England, Wales and Scotland would be able to support more than one such institution.

Given the high cost of ensuring that the role defined for this group of institutions could be discharged of itself, it is unlikely that England, Wales and Scotland would be able to support more than one such institution.

Considerations of manpower planning related to subjects of specialization could be a matter for drawing broad rather than fine distinctions and for dealing particularly with shortage subject areas. The objective for research and consultancy should be to provide the conditions necessary for both basic research and applied research to flourish within, wherever appropriate, a carefully developed interface between higher education and industry.

Such arrangements could safeguard the right of academics to determine the nature and the course of their research; they could also ensure that academics and their institutions were well informed about and sensitive to the research problems requiring public attention.

A rethinking and redefining of the roles of institutions would be of paramount importance. Such planning would benefit from examples drawn from Scandinavia, France and North America. It would need to have close reference to the present binary structure of higher education in Britain and to seek changes which preserve its advantages and minimize its shortcomings.

Advantage could be drawn from identifying two major groups of institutions, both devoted to the pursuit of the general educational objectives which have been proposed, but differentiated in their relative concerns with basic research on the one hand and operational research and consultancy on the other.

In addition to recognizing the facts of the present situation in Britain, such a relative division of responsibility would reduce the difficulties which currently arise from the conjoint pursuit of universal academic values and shortcomings of such a division of responsibility would need to be minimized by ensuring that all institutions were provided with the status and the financial and administrative arrangements necessary to discharging their

roles and to collaborating. Two major sets of institutions are envisaged: 1. In a country heavily dependent for its economic viability on scientific and technological development and with a strong tradition of humane scholarship, it is essential that there should be a group of major institutions capable of pursuing at a research and seeking to develop applications wherever possible. Such institutions with postgraduate research and study. They would have also a substantial interest in undergraduate education, appropriate to developing for students a general set of intellectual powers relevant to application and subsequent scholarship.

This group of institutions would need to be the centres for investment in "big" science and technology and their equipment grants would reflect this role. It would be essential for this set of major institutions to establish both formal and informal networks of communication with the private and public sectors of the economy. It would be necessary to ensure that the high cost of ensuring that the role defined for this group of institutions could be discharged of itself, it is unlikely that England, Wales and Scotland would be able to support more than one such institution.

Given the high cost of ensuring that the role defined for this group of institutions could be discharged of itself, it is unlikely that England, Wales and Scotland would be able to support more than one such institution.

In order effectively to complement the role of the first group of institutions, there would need to be a planned division of responsibility between these institutions in terms of their specializations of research. 2. In order effectively to complement the role of the first group of institutions, there would need to be a planned division of responsibility between these institutions in terms of their specializations of research.

The emphasis given to preparing students directly for industrial and professional careers would not need to be at the expense of the students' education nor at the expense of departments concerned with the social sciences and the humanities. It would be consistent with the ethos of this group of institutions that they should provide for both degree and non-degree students and for a substantial concern with part-time study. In this way they would again have a major regional role.

Research and consultancy would wherever possible be conducted in close association both with industry and with institutions in the first group. The secondment of research (and teaching) personnel between industry and institutions, coupled with the appointment of visiting fellows and professors would be an important concern. It would be profitable for institutions in this group to develop postgraduate programmes of research and study in close collaboration with industry and with group one institutions.

The institutions in this second major group would need to take steps to ensure that their regional networks with industry, commerce and the professions were highly interactive and mutually productive. This would require staff specializing in regional liaison and the intensive development

of workshop and short-course activity concerned with both training and technology transfer. At the national level, institutions would need to develop comparably strong networks and training activities for their major subjects of specialization.

It would be important that the means to effective interaction which they are in a position to create should be shared with adjacent institutions in the first group. Indeed, the emergence through such collaboration of strong institutional links and strong regional networks could assist in advancing the concept of socio-technical communities within the regions and so provide a major source of stimulus for economic and social development.

Within this group of institutions staff/student ratios would need to reflect the substantial investment of staff time in building fruitful links with the outside world, including research, consultancy and the supervision of sandwich course students. The selection of staff would need to take account of industrial and professional experience as well as academic qualifications. And it would be important to relate procedures for staff development, tenure and promotion to the ethos of the institutions.

Major institutions discharging this important national and regional role of providing for higher education the most thoroughly developed set of interactions with industry, commerce and the professions, would need to be selected with reference to their capacity to function as effective regional centres and, wherever possible, for an established ethos consistent with their role. They would be drawn primarily but not exclusively from the polytechnics and the technologically-orientated universities.

Some or all of the polytechnics might remain within the local authority system, provided that they were granted charter status and given therefore operational authority and the right to excel fully in their role. It is

In arriving at solutions which were in the national and the regional interest, attention would need to be given to considerations such as the effective concentration of resources, a minimum size of institution, and the notion of associate or satellite institutions linked with those in the two major groups.

In order to ensure that a substantially revised strategic plan for higher education were capable of effective implementation, it would be necessary to set out an appropriate financial framework for the whole system. Decisions on the relative units of resource for postgraduate, undergraduate and non-degree students, and correspondingly for full-time and part-time students, would necessarily reflect assessments of the appropriate academic and non-academic staff/student ratios.

These assessments would in turn be relative to the roles of institutions. However, it would be important to be entirely clear as to why, if this proved to be the case, a standard unit of resource were not allocated for a given type and level of course, irrespective of institution. It appears unlikely that the dual-support method of research funding in its present form, operating through the UGC and the research councils, would be capable of meeting the needs of a changing and desirably restructured system of higher education.

It is suggested that the dual-support system should be generalized across the whole of higher education and coupled with a system of allocation which is highly discriminating and carefully monitored. It would be appropriate to base the allocation of equipment grants to all institutions on the assessment of three sets of bids: research needs, teaching needs and inter-related research and teaching needs.

Bids would need to be geared to forward, five-year institutional views of the expectations for research and consultancy, subject to evaluation by the research councils before allocation.

tions were made. Financial support for specific projects would be available from the research councils for all institutions.

The third element of financial provision would need to be related to the special circumstances of each institution. These circumstances would, of course, vary substantially, but it would be important that the judgement as to their nature and rationale should be a matter of public knowledge, at least at the level of detail appropriate to an annual report on expenditure.

A strategically planned system of higher education of the type which is being suggested would benefit greatly from a high degree of mobility both between institutions and between higher education and the world of affairs. The achievement of such mobility would be contingent on two further policy changes. First, it would be necessary to rethink and generalize the career structure and salary scales for higher education as a whole. Second, it would be appropriate to recognize that special achievement in research, consultancy and teaching should receive financial recognition beyond the normal provisions of the career structure.

Given acceptance of the arguments advanced for an integrated system of higher education, it would be necessary for the UGC and the NAB to be merged. A reconstituted body would then deal with the detailed planning and management of the system of higher education within an overall framework established by a broadly conceived strategic planning organization.

Significant changes in role definition and structure within an integrated system of higher education would also make possible the more effective use of scarce resources and increased institutional efficiency. In time, such changes would provide a firmer base from which to argue for increased investment in meeting the country's

need to meeting it.

The author is director of Bristol Polytechnic.

A road map with no signposts to profit

To the average American university president, a strong relationship with the corporate community is a fact of life. The relationship is profitable, both in terms of academic enhancement and the financial well-being of the institution. From the corporate viewpoint, it is also profitable (why else would they do it?) and provides direct access to intellectual endeavour.

As a university president who works extremely hard to strengthen and expand corporate ties with his institution, I wondered how other educational systems in highly industrialized countries interacted with business and industry. I selected the United Kingdom and applied to the Fulbright Commission with a study topic, "The relationship of British universities to business and industry". I arrived at Warwick University the day the DES Green Paper was published. I was not prepared for the reception I received.

It is an interesting document. Unlike my new colleagues, I at first found little fault with it. It struck many parallels with the US system. Also, I felt, any body which pours as much money into an educational system as does the UK government deserves some voice in the direction of the system.

Two months later, though, I have some serious doubts about the Green Paper. In eight weeks I have become somewhat conversant with UK universities and their considerable array of talent. I am impressed to say the least. In eight weeks I have also gained a better understanding of UK business and management styles and observed some of the philosophies at work in British industry and commerce. In this regard, I am somewhat less impressed and even a little dismayed.

My interviews with academics, business executives and industry consultants revealed some recurring criticisms of UK business attitudes: ● too much concern with immediate profit and little vision for the future;

● little priority for research and development budgets within the corporate structure;

● lack of appreciation for an academic degree by senior executives who themselves are not university graduates;

● the absence of continuing education for staff within the UK corporate community;



A road map with no signposts to profit

the significant lack of personal involvement by business executives in the education system which is providing their future employees.

These all seem to have some validity. Travelling around, I find willing and talented academics poised to conduct applied research only to find that research and development budgets are, in many trade classifications, where funds do exist there is often a reluctance on the part of the business executive contracting the research to pay overheads to cover institutional expenses. The overheads being debated usually amount to only 40 per cent of the project costs (not including salaries). A bargain by any comparative standard.

Certainly, there will be developing firms who cannot afford to cover overheads, but the nature of applied research is such that it is critical to the sponsor and of intellectual interest to the investigator. This is often the case in the US and waivers are granted accordingly. But corporations with consistent profit habits should be willing and eager to pay appropriate overheads since it provides access to expertise without adding to technical staffs.

Criticism of UK management styles does not stop at research and development. Only the very major firms or those in high tech have ongoing training programmes for their staffs. In a recent *Times* article, Secretary of State for Employment Mr Tom King noted that "British companies spent on average only 0.15 per cent of turnover on training last year — so little that it hardly shows up on the balance sheet. That is one seventh of the American figure and one fourteenth of the best in West Germany".

Acquainting oneself with the problems of the company and the changes being experienced in the market are good business practices. American business firms operate a system of continuing education in both student (employee) numbers and gross budget of expenditure.

Yet another complaint from academics is the apparent inability of the UK business community to capitalize on new discoveries and transform them into commercial success. Again, the charge has some grounds; Britain has more Nobel Laureates per capita than any nation in the world; the

creative genius is here, but who is taking advantage of it?

Let the reader think my concerns lie strictly with corporate attitudes, let me point out quickly that, in my judgement at least, British universities are not without guilt. Virtually nothing has been done within the academic institutions to create an awareness on the part of the public or the politicians of the major role education can play in solving some of a nation's problems. Who really knows how much talent exists on British campuses and what that talent is capable of doing?

Yet, when one examines Salford University and the image it enjoys in public circles, one must conclude that a professional, full-time public relations staff makes a substantial difference. That a campus has a high opinion of itself is now an exercise in banality. It is what others think of it that will determine education's priority in the 21st century. And educators must accept the fact that politicians vote with their glands as often as they vote with their heads.

The Green Paper affords a golden opportunity for British education to step boldly forward and show its capabilities. But the policy makers must remember that it always takes two to tango. What happens, as an example, if the UK campus structure is moulded to accommodate the nation's industrial needs in an era where its industrial leaders focus heavily on today's profits while ignoring tomorrow's opportunities? It would be the ultimate irony if the Green Paper created a vast reservoir of teaching and research talent that served primarily the commercial needs of the UK's international competitors who were smarter and quicker to take advantage of such a national treasure. At best, it would create a new dimension for the term "brain drain".

The Green Paper is a good example of glandular reaction. It is a good concept, but ignores the industry. The road map for higher education's role in the new scheme is clearly defined. Who now devises the Green Paper for the profit sector?

The author is president of Alfred University, Alfred, New York, and currently Fulbright Fellow at the University of Warwick.



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مكتبة الأصل

BOOKS

Literary trends

English Fiction of the Victorian Period 1830-1890
by Michael Wheeler
Longman, £14.95 and £5.95
ISBN 0 582 49236 X and 49235 1

The Victorian Age was not only the longest but also the greatest in the history of English fiction. "Michael Wheeler's opening sentence indicates the challenge he faces in writing this critical introduction. It was an age incredibly productive of formidable novels. In almost every year between 1830 and 1890, at least two famous works of fiction appeared. In 1859, for example, *The Woman in White*, *A Tale of Two Cities*, *Adam Bede* and *The Tale of Richard Feverel* were published, among others; in 1860, came the beginning of *Great Expectations*, *The Mill on the Floss*, *Evan Harrington* and *Franklin's Passions*. The literary historian has also to take account of the publication over the past thirty years of numerous important editions and biographical, historical and critical studies, which have revealed much about the personal, ideological, social and material issues and pressures affecting the production and reception of the novels.

Having assimilated this body of creative and critical work, Dr Wheeler has written a clear, comprehensive review and analysis of Victorian fiction intended mainly for students in higher education. In his introduction, he surveys some of the literary conditions and expectations of the time, including the constitution of the reading public, the tensions between realism and romance and those between entertainment and instruction.

Dr Wheeler's critical approach is traditional and uncontroversial; he does not radically "re-read" the novels in the light of recent linguistic, structuralist and political theories. But he makes a number of points that his readers can profitably ponder. Observing the easiness of Thackeray and Dickens in their presentation of adult sexuality in *Henry Esmond* and *David Copperfield*, he suggests that Thackeray "seems to be aware of the fact that he is on difficult ground, whereas Dickens does not". He notes that a reading of *Silas Marner* can help appreciate George Eliot's tackling the problem of conveying synchronic action in *Middlemarch*. Some of *The Egoist*, he thinks, is reminiscent of *The Rape of the Lock*. Such comments, though not startlingly original, are perceptive and appropriate in a wide-ranging introductory study, which should be critically alive but not distractingly so.

Henry James will appear in another volume in this Longman series (*American Fiction 1865-1940*), so is omitted from Dr Wheeler's book. As he realizes, this is regrettable. In an essay "The Art of Fiction," an essay so close to the subject of this book, is only glanced at.

Helpful features of the book are a chronological table of publications and historical and cultural events, classified book-lists and full biographical and bibliographical information on the novelists.

Donald Hawes

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Our mutual friend

Money and Fictions: literary realism in the Victorian novel
by John Vernon
Oxford University Press, £12.50
ISBN 0 19 147287 7

"There's no doubt but money is to the fore now," a character in W. D. Howells's *The Rise of Silas Lapham* (1885) observes. "It is the romance, the poetry, of our age. It's the thing that chiefly strikes the imagination." There is certainly no doubt that by the time those words were uttered money had struck very deeply indeed into the literary imagination, and it has often been pointed out that the work of most of the great 19th-century writers (novelists especially) can be said to share the personal obsession of Bella Wilfer in Dickens's *Our Mutual Friend*: "The whole life I place before myself is money, money, money, and what money can make of life."

Bella has to mature from the first to the second part of her confession, and she can achieve that only by renouncing money for love. Once the lesson has been learnt she is rewarded with all of the money she would earlier have sold herself for. What is difficult for the modern reader to accept is not Bella's change of heart but Dickens's apparent approval. "How pleasant it is to have money, helgh ho!" A. H. Clough sang on behalf of his fellow-Victorians. If he wasn't being totally serious, he wasn't being totally ironic either.

It has also often been noted that money is not simply a recurrent theme in fiction, but a formative element in the doctrine of literary realism as it develops from the early 18th century: the growth of industrial capitalism and the materialism of the realistic novel are connected in a large number of different ways, both straightforward and indirect. John Vernon's concern is to establish a link between "the novel's claim to represent reality and money's claim to represent things" that is not, therefore, unfamiliar or surprising. Some of the novels discussed in *Money and Fictions* — Gissing's *Eve's Ransom* and Knut Hamsun's *Hunger*, for example — are adventurously chosen, though the novelists most centrally here are those one might expect to find in such a context — Defoe, Austen, Dickens, Trollope, Balzac, Dostoevsky, Zola, Gissing, James.

Vernon describes his approach as not Marxist, but influenced by Marxist thinking. What he seems to admire in

To adapt a cliché

Pinter: the player's playwright
by David T. Thompson
Macmillan, £22.50
ISBN 0 333 36933 5

Mr Thompson's study of Pinter is one that puts the emphasis on Pinter as actor-turned-dramatist, but without capitalizing on the attack which Nigel Dennis made in 1970 that Pinter plays are "secondhand oddments" derived from other playwrights, with their originality lying merely "in the very peculiar scope they offer to the actors in them". The peculiar scope is not denied, and the extent to which Pinter himself actually sympathizes with Dennis's point of view is disarmingly admitted, but the burden of Thompson's argument is that all this adds up to a considerable strength rather than a weakness.

Pinter's plays are seen as offering a unique synthesis of various forms of postwar theatre, both "classical" and popular. These include Greek and Shakespearean drama, which Pinter acted in as a member of the touring companies led by A. C. Newman and Donald Wolfit in the early 1950s; the standard repertory productions of plays by writers like Agatha Christie, Hugh Hastings and John Van Druten,

in which Pinter also took part as a provincial actor during the late 1950s; and the variety acts and radio comedy shows of comedians such as Tommy Trinder, Max Miller and Tony Hancock, in which Pinter did not perform, but which he enjoyed and admired. At this stage in his career Pinter worked under the pseudonym of "David Baron", and he seems to have excelled in emotional and sinister parts, finding the conventional nature of the "well-made" play an asset rather than a barrier to successful performance. This is carried over into his work as a dramatist, where his use of stock characters and well-worn situations shows him still to be "the practical man of the workaday rep". The four-walled room of the typical prosaic arch play, the strong, often stagey "cuchains", the deliberate use of realistic props and, above all, the flat cliché language and highly speakable rhythms of his naturalistic dialogue are the resources with which he was familiar as an actor. But the result is not a mere pastiche. These materials are transformed, and their expected accompaniments, the implications of the well-tried formulas, are denied as the familiar form is undermined from within. What promises certainty becomes riddled with uncertainty, and, in Pinter's own words, "below the word spoken, is the thing known and unspoken".

Thompson reinforces this point with a quotation from *The Homecoming*: "I mean there are lots of things which tick in the night, don't you

find that? All sorts of objects, anything else, you wouldn't call them, but you would call them. They give you no trouble. But in of them is liable to start letting out a bit of a tick."

Ruth's glass of water becomes just such a sinister commonplace item, enhanced by typically innocuous dialogue, it takes on the power of a weapon in a game of sexual bluff and intimidation, and ultimately becomes a "counter" in a deeply felt struggle for dominance between Ruth and Les. In this it is a representative example of the subterranean menace generated in Pinter's theatre by devices of fatality, and through a verbal scope of expressiveness, which offers scope for action and access to a deeply disturbing performance. The hallmark of this theatre is ambiguity. The plays prompt interpretation, but also defeat attempts to be at all precise about them. Hence the variety of "meanings" which have been read into *The Birthday Party*, *The Caretaker* and *The Homecoming*, and them on the printed page inevitably Thompson from an actor in the original cast of *The Homecoming* is significant: "It's a very full play and you into it." An actor's playing of the part tends to slant its meaning in one sense or another, but, even so, the sense of being in a familiar situation, and familiar surroundings which have been cut adrift from their usual anchorage inevitably creates a kind of puzzled anxiety in the audience. The reassurance is sought and denied, and the dispersal finally serves to underline of meaning generated within the play. Nevertheless, that such an effect is achieved through the exploitation of the actor's skill as an actor-dramatist, which is that awareness into motion and enables it to leap across interpretation directly to an audience's instincts. The result remains something of a mystery, but Thompson's book is a useful contribution to the justification, if not elucidation, of that mystery.

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R. P. Draper is professor of English at the University of Aberdeen.

Fox and hedgehog

The Devil's Party: critical counter-interpretations of Shakespearean drama
by Harriet Hawkins
Oxford University Press, £15.00
ISBN 0 19 128142 2

The Devil's Party is a kind of fugue in which an attack on the reduction of modern Shakespeare criticism to a series of views about drama. The conceptions between the subjects are made with some cunning. The disparagement of the tragic hero by the Eliot/Leavis school, the demonstration of the moral inadequacy of such characters as Juliet and Desdemona by "shocked" American academics, and the debunking of Shakespeare by directors in the contemporary theatre all seem to Harriet Hawkins to derive from the neo-classic tradition of defusing Plato by defusing Shakespeare. There is not the least danger of enfeebling ourselves or society by being drawn into an emotional identification with the Hamlet of T. S. Eliot, Eleanor Prosser or the Royal Court Theatre.

Plato was right, says Harriet Hawkins; Shakespearean drama is deeply and ineluctably disturbing, and in what way it is a true picture of life is the question that must continuously be faced. But the whole tendency of

Shakespeare interpretation is to simplify, to dilute and falsify the real Shakespearean challenge. Harriet Hawkins makes much use of the hedgehog/fox opposition. Critics and directors are the hedgehogs who know one thing. Remorselessly they try to make a hedgehog out of the Shakespearean fox who knows so many things. The author cannot raise more than two cheers for the current acceptance of openness of interpretation. It's a best-of-times/worst-of-times situation. It's not openness of interpretation she advocates, but the openness of the plays, which continually defy every single interpretative effort to reduce their multiplicity to the critic's or director's ruling passion.

This is inevitably (as the author insists) an inconclusive book. It is inconclusive on the psychological and social effect of art, being more concerned to demand that critics' strictures do not continue to be shrifted or bypassed. It is inconclusive on the kind of interpretation that can draw us nearer to Shakespeare. The Shakespearean play is receptive to every ideology; this book abundantly demonstrates the range of accommodation of Shakespeare. It is a serious and amusing account of current interpretative fashions.

Philip Edwards

Philip Edwards is professor of English at the University of Liverpool. His latest book, *"Shakespeare: a writer's progress"*, will be published early next year.

BOOKS

A force for peace

Earl David of Huntingdon, 1152-1219: a study in Anglo-Scottish history
by K. J. Stringer
Edinburgh University Press, £30.00
ISBN 0 85224 486 X

The union of 1603 brought together the crowns of England and Scotland, two nations who had been enemies for three hundred years, and the memory of these hostilities has persisted to the present. It is hard for us now to conceive a time when this national confrontation did not yet exist. Nevertheless, as Dr Stringer points out, the 12th and 13th centuries were a time of peace. Such conflicts as occurred, the appearance of Scottish Kings and nobles in the "anarchy" of Stephen, the rebellions of 1173 and 1174, in the risings against King John, were conflicts within a single feudal society, not national wars; and from 1217 to 1296, peace was unbroken.

One of the features of this period was the emergence of an Anglo-Scottish nobility, families mainly of Anglo-Norman origin, who had acquired lands in Scotland. Dr Stringer's subject, Earl David of Huntingdon, was one of the most prominent members of this Anglo-Scottish nobility. This book is an account of his career, of his lands and their administration, and an edition of his surviving charters, all seen against the setting of this wider Anglo-Scottish society, which is discussed more fully in the final chapter.

David was the brother of William the Lion, King of the Scots from 1165 to 1214. He held two great honours: the earldom of Huntingdon in England, formerly held by the Scottish kings, and the lordship of Galloway in Northamptonshire. He meant to be buried in the abbey he founded on the shores of the Tay at Lindores, but the journey was too far, and his servants only took him to Sawtry Abbey in Huntingdonshire.

Naturally enough, his tenants also acquired lands in both countries: the Lindesays for instance who were to have a prominent part in later history as lords of Crawford in Lanarkshire, held on determinedly to an estate they possessed at Molesworth in Huntingdonshire, lately much in the news; and there were many other Anglo-Scottish lords: Bruce in Annandale and York-shire, de Moreville in Lauderdale, Cunningham and Westmoreland; and less well known, Lovel in Hawick, and in Castle Cary in Somerset. Figures are impossible to calculate, but at least half of the major lordships in Scotland in the 13th century were held by Anglo-Scottish families and perhaps a fifth of English barons. These lords obviously had to reconcile their loyalty to two kings, but such conflicts were a normal part of feudal politics, and there is no evidence, before the age of nation states, that there was real difficulty. Dr Stringer argues that these families were a powerful force for peace. Indeed it looks from his account as though things were moving steadily towards a wider and more unified feudal society which in time might have brought about a natural union which would have changed the future of both countries.

What went wrong? The obvious answer is the Wars of Independence; and it would have been beyond Dr Stringer's brief to probe that problem. The Scots have always blamed Edward, but that is not a good enough answer. Edward, like many others who have brought about disaster, was genuinely anxious to do justice and to maintain the peace. Many Scots turned to him for that very purpose and there was no reason why his sword of the throne to Baliol should not have worked. Things went wrong after 1292, not before; but that is a different story.

Bruce Webster

Bruce Webster is senior lecturer in history at the University of Kent.



A Turkish musician playing in the streets of Jerusalem, an illustration from Yehoshua Ben-Arieh's book *Jerusalem in the Nineteenth Century: the old city* (Croom Helm, £25.00).

Both sides

The Prince and the Pretender: a study in the writing of history
by A. J. Youngson
Croom Helm, £16.95
ISBN 0 7099 2912 9

Youngson has made a deep study of the numerous and generally easily accessible sources for the 1745 Jacobite Rebellion, both primary and secondary. These range from eyewitness accounts through the standard historical scholarship like Professor W. A. Speck's biography of the Duke of Cumberland and F. J. McLynn's monograph on the Jacobite Army.

The result is not, however, as one might have anticipated, a carefully balanced assessment of the 45 equipped with a carefully detailed discussion of the historiography of the affair which would have appealed to both an academic and a general readership. Instead, it is a case study in the writing of history which offers first a philosophical discussion of the problems and limitations of the craft both in general and with particular reference to the time of the Young Pretender. This is followed by not one but two accounts of the 45 and its origins, sympathetic respectively to the Hanoverians and to the Jacobites. Youngson comments fairly enough:

Neither version is crude propaganda, because in neither is there resort to fabrication, distortions, serious omission or blatant appeal to the emotions. But even without these, what is present — and for that matter what is past — can be understood and represented in very different ways.

He is concerned not so much to give the reader a pleasurable, evocative experience of one of the most romantic episodes in British history as to sharpen the reader's perception of the pitfalls involved in the acceptance of any statement or judgement made by the historian or, come to that, by the politician. The book is, then, intended as an inoculation against the unreality of uncritical perception; it is a clinical measure rather than a work of literature.

An introduction of 30 pages sets out the central argument that all perception is selection not simply because we cannot know everything which is known at the crucial moment, but also because we select consciously and

unconsciously from what we do know and even "remember" what never happened at all. Youngson quotes interestingly Jean Piaget's account of his vivid memory of being kidnapped from his pram in the Champs Elysées; in fact the kidnapping was a fabrication of his nurse and Piaget had turned into a visual memory what he had told in later years, not what he had actually experienced. The unreliability of eyewitnesses' accounts, again, is demonstrated from a comparison of a number of reports of Charles Edward's

death. In the Jacobite tradition, at the rear, MacDonell of Lochgarry, a Highland gentleman, has the Prince shot under him when he was in the front line; while John Home, who wrote his *History* decades later but based it on meticulous research and consultation with eyewitnesses among his contemporaries, states that the Prince was restrained from advancing when the Highlanders were repulsed.

The two versions of the 45, each of just over a hundred pages, follow; each has been written meticulously with an eye to fairness. Apocryphal and scandalous stories have been omitted, but if insubstantial fact such as the unhappy nature of the marriage of the Old Pretender to Clementina Sobieski is included, and later opinions ascribed in favour of contemporary accounts. But to produce two contrasting versions, Youngson has adopted two sets of prejudice, concentrating on those who were *en nemore* with the cause which he was currently promoting, including supplementary material conducive to the case being made, and offering very different interpretations of events and people. The Hanoverian version, for instance, emphasizes the global context of the 45 Rebellion and the role of the French in supporting the various Jacobite attempts from 1708 onwards; the Jacobite version emphasizes the antiquity of the Stuart claim to the English throne.

There is no doubt that Professor Youngson enjoyed writing this unusual book. Whether readers enjoy it will depend upon their cast of mind. The tenacious and the analytically inclined will derive much from it. No concession is made to the reader — end-notes are used in place of footnotes and the reader is expected to carry a great deal of material over the compass of a hundred pages or more; there is no bibliography as such or review of the sources apart from the brief discussion in the introduction; a dramatist's personae is not given nor are there any illustrations. This intriguing little volume does rather exemplify history with the poetry left out — but then that was the author's intention.

G. R. Batho

G. R. Batho is professor of education at the University of Durham.

Women's advance

The Origins of Modern Feminism: women in Britain, France and the United States 1780-1860
by Jane Rendall
Macmillan, £20.00 and £7.95
ISBN 0 333 28910 5 and 28901 3

Writing history is a form of conservation, rescuing from oblivion the lives and deeds of our forefathers. Feminist historians in recent years have been busy bringing to light and recording the half-forgotten activities of women in the past. Jane Rendall's book is part of this work of conservation. Although it deals with three countries and appears in a series whose title might lead one to expect an emphasis on comparative analysis, it is concerned primarily to record what is known about the public and semi-public activities of British, French and American women in the period between the French Revolution and the mid-19th century.

Theoretical feminism arose from the revolutionary events in America and France and the doctrine of natural rights in terms of which they were justified. In practice, however, as Rendall shows, there was little connection between revolutionary traditions and the progress of women's movements. The ideal of "republican motherhood" subscribed to by the revolutionaries could be used to reinforce the constraints of domesticity; the fame achieved by notable feminists like Mary Wollstonecraft reinforced conservatism by connecting feminism with loose living; while in France, the land of the Revolution, the Napoleonic Code left women worse off than before.

Women's advances into public life in the early 19th century came about in a more roundabout way than the claiming of political rights, owing a great deal (like Weber's capitalists) to the indirect effects of evangelical religion. As Rendall remarks, it is not surprising

quintessentially female: humility, purity, submission, self-denial. In terms of these values, women could claim a special mission, and even a licence to preach. In New England, the female converts flocking into the churches outnumbered the men by three to two, and quickly found themselves new spheres of activity in associations to promote moral reform, temperance, Sabbath observance, and, most significantly, the abolition of slavery. In Britain, similarly, while Evangelicalism might underline the domestic virtues, it also prompted the good wife and mother to engage with a clear conscience in organizations and activities outside the home. The pattern in Catholic France was different. There too religious commitment among women increased in the early 19th century, but instead of forming voluntary organizations and gaining experience and confidence in public life, women vowed themselves to obedience in the increasing number of

religious congregations, in the process reinforcing the hierarchical and authoritarian pattern of church and society.

Another way in which women almost inadvertently worked for their own emancipation was in developing education, initially on the grounds that a good wife and mother needs education, but gradually becoming more ambitious as school and teacher-training establishments spread. While remaining conservative in their assumptions, some women remoulded the female role by their own actions, like Catherine Beecher, promoter of the American schoolmarm. Seeing women as missionaries of civilization and Christianity to western settlements, she toured the country speaking at public meetings, organizing groups of teachers to go West, and generally setting an example of formidable female competence. Once again, this was a sphere of practical emancipation that was most notable in America and least in France, where education was a political issue fought over between an authoritarian church and a centralizing state.

Where overtly political action was concerned, France once again lagged behind in spite of the prominence of women in revolutionary crowd scenes. In Britain, women formed societies as early as 1819 to campaign for the extension of male suffrage, while the ladies of the Anti-Corn Law League established a long-standing political tradition by holding fund-raising bazaars. The most prominent cause, however, which enabled women to act in public in the interests of others was the anti-slavery movement, in the USA the direct precursor of the women's movement itself.

By 1860, when Rendall's survey closes, feminism had emerged as a self-conscious movement in Britain and the USA, but not in France. Her material constantly points to the importance of religion in explaining the difference, and it is a pity that she neglects the opportunity to explore explicitly and extensively upon this. The book is not designed, however, as a comparative sociological investigation of the conditions for feminist take-off. Instead, it is a careful com-

monwealth of the male harvesters) by the feminist historical research of the past two decades.

Margaret Canovan

Dr Canovan is lecturer in politics at the University of Keele.

Katharine Moore's 1974 book *Victorian Wives* has been issued in paperback by Allison & Busby at £3.95. The book draws together the stories of 12 Victorian women from both Britain and America, including Jane Carlyle and Harriet Beecher Stowe; it also considers the depiction of women in Victorian fiction.

Paying for Welfare by Howard Glenister, reviewed by Robert Sugden in THES July 5, is available from Blackwell in both hardback and paperback. The paperback price is £7.50 and its ISBN is 0 631 13872 9.

Religious Enthusiasm in the New World

Heresy to Revolution

DAVID S. LOVEJOY

In seventeenth and eighteenth-century England and America, established society branded as "enthusiasts" those unconventional but religiously devout extremists who stepped across orthodox lines and claimed an intimate, emotional relationship with God. This comprehensive study of the enthusiasts who migrated to the American colonies as well as those who emerged there tells us much about English attitudes toward religion in the New World and about the vital part it played in the lives of the colonists. By 1776 enthusiasm had spilled over into politics and added a radical dimension to the revolutionary struggle. £22.95 Hardback 386pp 0-674-76864-1

Wills and Wealth in Medieval Genoa, 1150-1250

STEVEN EPSTEIN

Steven Epstein's study of the wills of 892 individuals who lived in medieval Genoa provides exhaustive detail about a broad cross-section of the population. As these people lived during a key century in the city's rise to importance, the book makes a great contribution to understanding both medieval and Renaissance history and the social history of the family. *Harvard Historical Studies*, 109 £20.75 Hardback 288pp 0-674-96356-8

HARVARD

UNIVERSITY PRESS 126 Buckingham Palace Road London SW1W 9SD

Animal motives

Animal Behaviour
by David McFarland
Penguin, £11.95
ISBN 0 274 02103 6
Social Behaviour in Mammals
by Trevor B. Poole
Blackie, £13.95
ISBN 0 216 91440 X

There has been a flood of good textbooks on animal behaviour in recent years, most of them, like David McFarland's *Animal Behaviour*, aiming to introduce undergraduates to the whole field, and rather fewer, like Trevor Poole's *Social Behaviour in Mammals*, restricting themselves to the behaviour of one particular group of animals.

McFarland is a leading figure in ethological research; he and his group at the University of Oxford have made significant contributions to our understanding of motivational processes in animal behaviour. A basic teaching text written by him is bound to excite interest, not least because much of his research writing tends to be rather forbidding to those who are not skilled mathematicians as well as skilled biologists, and I wondered whether this characteristically would pervade his latest textbook. The answer is emphatically not. It is written with great clarity, with obvious concern that student readers should understand and evaluate what they are reading, and that they should not simply absorb it unquestioningly.

The organization of the book is interesting and reflects the author's concern that students should grasp the principal concepts underlying animal behaviour sections dealing respectively with the evolutionary approach to behaviour, causal mechanisms of behaviour, and the relationship among evolutionary and causal explanations in the study of complex aspects of behaviour such as decision-making, language and animal awareness. As McFarland is keen to emphasize the benefits that derive from ethologists' concern both with evolutionary and causal aspects of behaviour, he goes to great pains to distinguish the kinds of questions that can be addressed by each approach and the respective limitations of those approaches.

McFarland chooses to start his book with genetics—a decision that is at first surprising, but one that proves to be a very good one. As ethologists place so much emphasis on the evolution of behaviour, and as they operate so firmly within the framework of neo-Darwinism, it is clearly important that students should be familiar with the basic concepts of Mendelian and population genetics, with the theory of natural selection and with the way in which these three topics are related to animal behaviour. It is good, therefore, to see these issues being dealt with here so explicitly. It is also good to see a thorough discussion of the means by which we can judge particular

adaptive explanations of particular behaviours. This is a topic that is frequently omitted from ethology courses, and whose omission can lead to ethologists rightly being accused of conceiving unsubstantiated and untestable explanations of the adaptive significance of this or that aspect of behaviour.

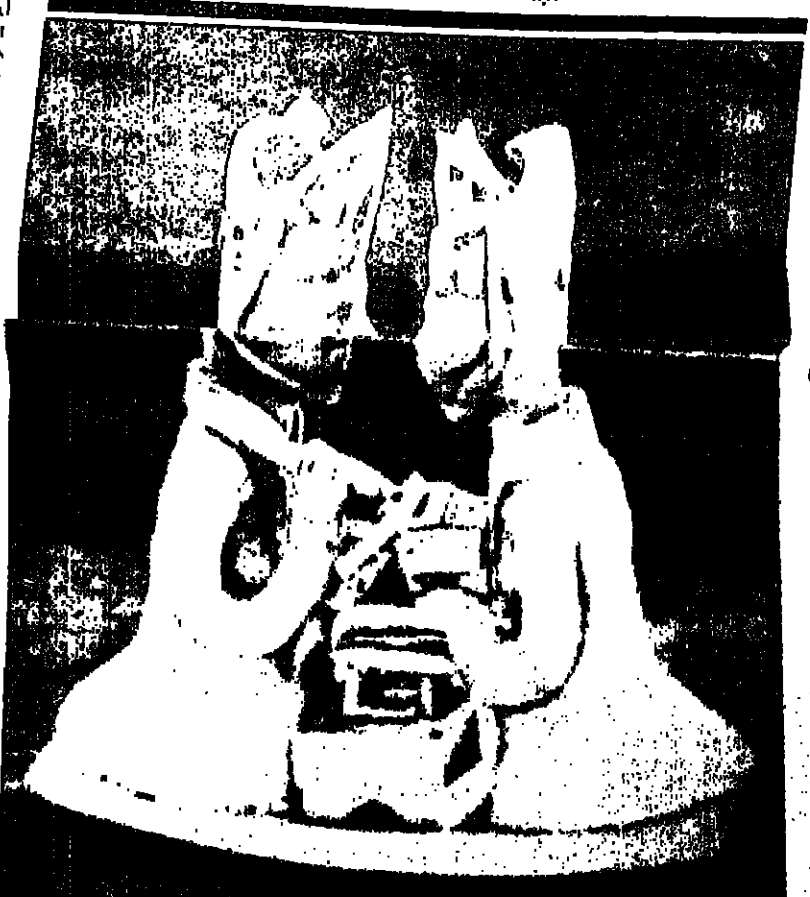
There are many other good things in this book, and a few that are less good. The range of topics is wide and impressive, extending from neurophysiology and sensory processes to social structure and animal awareness. It is pleasant to see prominence given to such influential but nowadays rather neglected research, such as John Crook's work on weaver birds in the early 1960s, one of the first major studies on the relationship between social behaviour and ecology. On the negative side, there is very little on the more complex aspects of mammalian social organization—nothing, for example, on H. F. Harlow's or R. A. Hinde's work on the development of mother-infant relationships in primates, and very little on dominance hierarchies or on the hormonal control of sexual behaviour. None the less, this is an excellent book, and one that, with its brief biographical sketches of biologists involved in the development of animal behaviour as a science and with its succinct end-of-chapter list of "points to remember", should be very attractive to students.

Poole faces a more difficult task than does the author of a textbook covering the whole of animal behaviour. What, after all, is special about mammals that

demands that their behaviour should be treated separately from the rest of the animal kingdom? What principles of behaviour are exemplified especially clearly in mammals? These are difficult questions that face any author who chooses to write about the behaviour of a particular taxonomic group, and I am not sure that Poole entirely succeeds in answering them. His approach is strongly evolutionary, and his strategy is to interweave fairly brief descriptions of theoretical issues, such as altruism or parental investment, with a multitude of detailed examples of relevant mammalian behaviour. The result is a book that is not always easy to read, and one that students will find more helpful if they have first read a book, like McFarland's, which tackles the principles behind evolutionary interpretations of behaviour much more extensively. None the less, as a source of factual information on particular aspects of mammalian behaviour, this book is a gold mine, for main chapters cover the senses and communication; reproductive behaviour; competitive and affiliative behaviour; and sociology. These are followed by a heroic chapter briefly reviewing the behaviour of each mammalian order. Undergraduate essays will undoubtedly be greatly enriched as a result of this book.

N. R. Chalmers

N. R. Chalmers is dean of science and reader in biology at the Open University.



This pottery piece of the Western Chin period (from 265 to 317) depicts the collation of books by two scribes sitting face to face, perhaps engaged in proof-reading. From Joseph Needham's *Science and Civilization in China*, volume five: *Chemistry and Chemical Technology*, part one: *Paper and Printing* by Tsien Tsuen Hsueh (Cambridge University Press, £45.00).

Basic circuitry

Analogue and Digital Electronics for Engineers: an Introduction
by H. Ahmed and P. J. Sprenghelm
Cambridge University Press,
£25.00 and £8.50
ISBN 0 521 26634 4 and 31910 2

Electronic engineering, once considered rather plebeian and restricted, is having a universal impact on society. Indeed, as the subject now encompasses a rapidly growing field of technology, it is well beyond the capability of most electronic engineers to maintain even a nodding acquaintance with all its branches.

Although many people might consider electronics to be a development of applied physics, it is currently being suggested, quite seriously by some industrial employers, that it is no longer necessary to teach electronic engineers the fundamentals of the subject, since nearly all future circuits will be built from integrated building blocks conforming to standard specifications. In my opinion, that view is entirely erroneous, and if put into practice would lead to a generation of highly-skilled but unskilled who would need to be re-trained every few years as some completely new technology emerged.

As the basic unit of electronic circuitry is the transistor, circuits built around the transistor form the backbone of any electronic engineering degree or similar syllabus. The order of presentation of material, however, is a matter of taste. In this book, the authors present a two-year course, which can be followed in an advanced, and I can recommend the book as a model for a lecture course. Judging from my experience, however, some expansion will be needed, especially in the branch of digital

the final chapters. Also, as Ahmed and Sprenghelm have assumed a basic knowledge of direct current and alternating current circuit theory, I would tend to agree with the concept of the combination of simple gates to form more complex digital circuits. The foundation would thus be covered in the first here would take over.

An introductory chapter, on the concept and principles of amplifiers (an extension of basic circuit theory), sets the scene for the course. Although considered, at least the student has an idea of where the greater part of the chapters, on field-effect and bipolar transistors, cover the physical basis of their operation, electrical characteristics, equivalent circuits, and construction. Chapter four then outlines the realization of operational amplifiers and their various uses, and the following two chapters expand on the use of operational amplifiers in circuits and back. Finally, there are two chapters on digital electronics; here, however, I much more detail on the realization of transistor-based circuit functions by

Text, diagrams and literary style are clear. There are worked examples of problems, useful summaries, and the end of each chapter, "Quiz questions" are set, each on a pair of chapters. However, although it might be possible for a dedicated reader to obtain a good basic knowledge of the subject from this book alone, a lot of background reading will be needed to appreciate fully the finer points of modern electronic circuitry.

P. J. R. Laybourn

P. J. R. Laybourn is reader in the

Reading programs

Learning to Program
by Howard Johnson
Prentice-Hall, £9.95
ISBN 0 13 57754 X

Teaching programming to complete beginners is always a daunting task—attempting to convey much detailed information, while at the same time trying to impart a practical skill. This admirable book offers a highly constructive way of approaching that task. Essentially a text on the Pascal language for novices, the book is based on a course at the Queen's University of Belfast first developed by Professor C. A. R. Hoare. Despite its exclusive concern with Pascal programming, the approach taken could be used with other high-level languages, and anyone concerned with the teaching of elementary programming would find the book useful and enlightening.

Johnston assumes that the student

to remain silent until ready to speak is of value in learning a language. He suggests that the first chapters should be studied while students are becoming familiar with a particular computer system, a topic not addressed in the book. Such an approach emphasizes the practical aspects of computing right from the start.

Subsequent chapters deal with Pascal syntax and program design, emphasizing particularly the notation, detection and correction of program errors; the systematic production of correct and efficient programs; and the data structuring features of Pascal. Exercises are included (a teachers' manual with solutions is available from the publisher).

I can strongly recommend this book to teachers of programming as well as to their long-suffering students.

Peter Wallis

Peter Wallis is reader in computing at the University of Bath.

Probing surfaces

An Introduction to Chemisorption and Catalysis by Metals
by R. P. H. Gasser
Clarendon Press: Oxford University Press, £25.00
ISBN 0 19 855163 0

A proper understanding of solid surfaces is central to many aspects of our present technological society. It has relevance to the electronic and computer industries, the large-scale manufacture of petroleum products through the use of catalysts, and such important phenomena as adhesion lubrication and wetting.

The subject, however, has had an unusually tortuous history. All sorts of interpretations of catalysis were advanced during the nineteenth century, most of which had a closer relationship with metaphysics than with science:

the philosopher's stone of the alchemists was a catalyst; it was not until 1800 that chemical theory—that is, the ideas of chemical changes—made the concept of transmutation of elements respectable. One of the earliest breakthroughs came in 1817 when Sir Humphry Davy discovered that when a mixture of coal-gas and air was passed over platinum it became white, not grey. This in 1831 Phillips presented the oxidation of sulphur dioxide to sulphur trioxide in the presence of platinum, which eventually led to the contact process for the manufacture of sulphuric acid. During the first decade of the 20th century, Haber and Mitsch in Germany developed methods for synthesizing ammonia by the catalytic hydrogenation of nitrogen. A little later the commercial catalytic hydrogenation of carbon monoxide to produce methanol was established. Today we see a country like South Africa relying heavily on Fischer-Tropsch catalysts for the manufacture of petroleum by hydrogenation of carbon monoxide produced from coal. With diminishing oil reserves Fischer-Tropsch catalysts will take on even

more significance at the beginning of the next century. It is indeed remarkable that our understanding of the mechanisms of surface-catalysed reactions is so well developed when we recall that in 1965 there was no direct experimental method available which could analyse the atomic nature of the surfaces of solids. What has made the past 15 years so significant for surface chemistry has been the development of experimental methods that can probe the atomic level of solid surfaces. In 1965 infrared spectroscopy was the only experimental technique that could provide direct information on surface bonding—and this was virtually exclusively for one particular type of molecule, carbon monoxide—there has been a rapid increase in the number of methods providing both structural and bonding information on surfaces. Common to all these developments has been the availability of ultra-high vacuum facilities (very low pressures) which had been considered to be very much academic curiosities some 20 years ago but are now a

prerequisite not only for good scientific research in surface chemistry and surface physics but also for the commercial development of new electronic devices.

A new book concerned with the catalytic chemistry of metal surfaces and aimed primarily at senior undergraduate or postgraduate students must be able to marry the vast background of information available, much of it having emerged over 30 years ago, with the exciting new experimental developments. At the same time the book should not be encyclopaedic. It must therefore present a careful choice of topics for discussion, it should be illustrative, and concepts and ideas should be emphasized at the expense of descriptive chemistry. Robert Gasser has clearly kept these aspects very much in mind. Divided into nine distinct chapters, his book progresses very naturally from some fundamental aspects of adsorption, molecular collisions with surfaces, metallic structures and bonding, to surface crystallography, electron emission, vibrational spectroscopy, and isotopic studies. The final chapter deals exclusively

with one particular catalytic reaction: the oxidation of carbon monoxide on palladium and platinum surfaces, where the advantages of bringing to bear the whole armoury of surface-sensitive experimental methods is illustrated.

Undergraduate students will find this a very useful book: few of its competitors are as compact but at the same time provide a blend of well-established background information with "frontier science". However, although the references have been chosen carefully, these may be adequate for the undergraduate, but they can only be regarded as "signposts" for the postgraduate.

M. W. Roberts

M. W. Roberts is professor of physical chemistry at University College, Cardiff.

In the review of Herbert Morawetz's *Polymers* (July 12), Viktor Meyer should have read Kurt M. Meyer.

Grants

LEEDS: Dr J. G. Lockwood, £19,579 from NERC (hydrological impact of moorland bracken clearance); Professor Greville, £20,000 from Greater London Council (homelessness in London); Mr D. R. Barnes and Professor Layton, £37,588 from Manpower Services Commission (evaluation of technical and vocational education initiative); Mr R. H. Harley in collaboration with CRI A/S Courseware Europe and Dansk Dataatmik Center, £115,600 from SERC (guides); European Communities (Intelligent HELP system for information system); Mr M. J. Smith and Mr J. R. Harley, £104,470 from SERC (guided computer aided instruction); Dr C. E. Whalley, £76,009 from City of Bradford Metropolitan District Council (evaluation of NSC-18 technical and vocational education initiative, Bradford Consortium); Dr J. M. Forbes, £10,473 from AFRC (guaranteed relationship between feedback signals in the control of voluntary intake in the dairy cow); Professor North and Dr P. R. Woodward, £39,650 from SERC (protein engineering); Professor Greenwood, Professor Shaw and Dr M. A. Thornton-Pett, £43,203 from SERC (structural chemistry of metallobenzene clusters); transition metal complexes and organometallic compounds); Dr N. Boden and Dr J. Bushy, £45,340 from SERC (new ligand systems for driven aggregation); Professor Robinson, £29,776 from Ministry of Agriculture, Food and Fisheries (vegetable and fruit peroxylase susceptibility to heavy metal ions); Dr A. C. Cumling, £30,640 from SERC (structure of genes encoding wheat ribosomal proteins); Dr P. C. Jewer, £38,362 from SERC (polymeric stress in plants); Dr J. S. Bale in collaboration with Dr R. Harrington, Rothamsted Experimental Station, £11,496 from AFRC (cold hardiness and overwintering survival of aphids); Professor Brook, £75,512 from SERC (entering of engineering ceramic correction of microstructure in aluminium); Professor Williams and Dr A. G. Clarke, £29,600 from SERC (incorporation of steric hindrance in polymerization); Dr A. N. Butler, £58,580 from SERC (quantification of strain in forging); Dr C. Hammond, £32,010 from Ministry of Defence (superplastic properties of new titanium alloys); Professor McIntyre and Dr J. G. Tomka, in collaboration with Dr H. Shaw, ICI Fibres, £30,326 from ICI (polymerization of ethylene oxide); Dr A. N. Butler, £58,580 from SERC (quantification of strain in forging); Dr C. Hammond, £32,010 from Ministry of Defence (superplastic properties of new titanium alloys); Professor McIntyre and Dr J. G. Tomka, in collaboration with Dr H. Shaw, ICI Fibres, £30,326 from ICI (polymerization of ethylene oxide); Dr A. N. Butler, £58,580 from SERC (quantification of strain in forging); Dr C. Hammond, £32,010 from Ministry of Defence (superplastic properties of new titanium alloys); Professor McIntyre and Dr J. G. Tomka, in collaboration with Dr H. 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Universities continued

University of Essex

Department of Electronic Systems Engineering
CHAIR IN TELECOMMUNICATIONS AND INFORMATION SYSTEMS
 Applications are invited from suitably qualified persons for the post of Chair in Telecommunications and Information Systems. The holder of the Chair will be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems.

The University of Essex is a leading centre of research and teaching in the field of telecommunications and information systems. The University is currently seeking a Chair in Telecommunications and Information Systems. The holder of the Chair will be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of telecommunications and information systems.

University of Aberdeen

Department of Chemistry
MOLECULAR BIOLOGIST/BIOPHYSICIST
 Applications are invited from suitably qualified persons for the post of Molecular Biologist/Biophysicist. The holder of the post will be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics.

The University of Aberdeen is a leading centre of research and teaching in the field of molecular biology/biophysics. The University is currently seeking a Molecular Biologist/Biophysicist. The holder of the post will be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of molecular biology/biophysics.

Fellowships continued

Churchill College, Emmanuel College, New Hall and Newnham College

CAMBRIDGE JOINT APPLICATION SCHEME FOR RESEARCH FELLOWSHIPS 1985-86
 The following colleges are participating in the scheme: Churchill College, Emmanuel College, New Hall and Newnham College. The scheme is open to students of the University of Cambridge who are seeking research fellowships for the 1985-86 academic year. The scheme is open to students of the University of Cambridge who are seeking research fellowships for the 1985-86 academic year. The scheme is open to students of the University of Cambridge who are seeking research fellowships for the 1985-86 academic year.

The University of Cambridge is a leading centre of research and teaching in the field of research fellowships. The University is currently seeking research fellowships for the 1985-86 academic year. The University is currently seeking research fellowships for the 1985-86 academic year. The University is currently seeking research fellowships for the 1985-86 academic year.

Polytechnics continued

THE HATFIELD POLYTECHNIC (IN CONJUNCTION WITH WYKEHAM FARRAGE ENGINEERING LTD) DIVISION OF CIVIL ENGINEERING Geotechnics Section POST-DOCTORAL RESEARCH FELLOWSHIP

Applications are invited for a Post-Doctoral Research Fellowship, tenable from 1 October 1985 for three years. The successful candidate will join a team led by Dr J A Little at Hatfield Polytechnic which is currently investigating the engineering properties of stiff, heavily overconsolidated natural clays. The research programme will employ existing state-of-the-art laboratory equipment and develop and evaluate new equipment and instrumentation for the testing of these and similar soil types in conjunction with Wykeham Farrage.

Ideally, applicants for the post should possess a good honours degree in Civil Engineering in addition to a Doctorate in Soil Mechanics. Candidates without a PhD but with a number of years academic and/or industrial research experience in the laboratory testing of soil at state-of-the-art level will also be considered. Salary is on the Lecturer II scale; initial salary will be £7812. Wykeham Farrage will enhance the salary by £2200 per annum for a suitable candidate.

Informal enquiries to Dr Little, telephone Hatfield (07072) 79140. Application forms and further details from the Staffing Office, The Hatfield Polytechnic, PO Box 108, Hatfield, Herts, AL10 9AB. Telephone 07072 79802. Closing date for completed applications: 24 August 1985. Please quote reference: 965



NEWCASTLE UPON TYNE POLYTECHNIC

TEMPORARY LECTURER II/ SENIOR LECTURER IN MATERIALS TECHNOLOGY/SCIENCE

Ref No. L47

Applicants should be graduates with appropriate academic qualifications and experience in the field of materials technology/science. The successful candidate will be responsible for the development and delivery of a programme of research and teaching in the field of materials technology/science. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of materials technology/science. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of materials technology/science.

Salary scale: £11,754 - £13,128 (per annum). Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

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PAISLEY COLLEGE A Scottish Central Institution

LECTURER IN ORGANIC CHEMISTRY

Paisley College is a major degree awarding institution funded by the Scottish Education Department, with 2000 full-time students on vocational, certificate, degree and honours degree courses. Applications are invited for the post of Lecturer in Organic Chemistry from candidates with a minimum of good honours degree. The successful candidate will be responsible for the development and delivery of a programme of research and teaching in the field of organic chemistry. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of organic chemistry. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of organic chemistry.

Salary scale: £11,754 - £13,128 (per annum). Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

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Polytechnics continued

KINGSTON POLYTECHNIC School of Information Systems Design PRINCIPAL LECTURER & SENIOR LECTURER/LECTURER II

required to teach at MSc and BSc Honours levels, one or more of the following subjects: SYSTEM DESIGN METHODS AND TOOLS DATA COMMUNICATION OFFICE AUTOMATION DECISION SUPPORT SYSTEMS & OPERATIONAL RESEARCH. Additional expertise or interest in one or more of the following areas would be an advantage: SOFTWARE ENGINEERING OPERATING SYSTEMS AND ARCHITECTURE INTELLIGENT KNOWLEDGE-BASED SYSTEMS DATA MODELLING AND DATABASE DESIGN. The post of Principal Lecturer is associated with the course leadership of BSc (Hons) in Information Systems Design. The School has a very strong research record and offers opportunities for consultancy.

Salary range: £13,773-£15,258 (bar) - £17,145. Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

KINGSTON POLYTECHNIC Faculty of Engineering School of Mechanical, Aeronautical & Production Engineering TEMPORARY LECTURESHIPS

Two temporary lecturers required for a one year period. The lecturers should have experience in any of the subject areas listed below. The appointments commence on 1st September 1985. Salary: Lecturer Grade II - £7,860-£12,213 inclusive of London Allowance (salary under review). Application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

LECTURER II/ SENIOR LECTURER IN PSYCHOLOGY

Applicants are invited for the post of Lecturer in Psychology. This is a small core group of posts in the Department of Health & Applied Social Studies. The successful candidate will be responsible for the development and delivery of a programme of research and teaching in the field of psychology. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of psychology. The holder will also be responsible for the development and delivery of a programme of research and teaching in the field of psychology.

Salary scale: £11,754 - £13,128 (per annum). Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

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Bristol Polytechnic

Department of Nursing, Health and Applied Social Studies TEMPORARY LECTURER IN PSYCHOLOGY

Applicants are invited from psychologists holding a good honours degree in psychology. The successful candidate will be expected to assist a small core group of psychologists in their support for the teaching of psychology across a wide range of professional courses in health and social services. Previous experience is desirable although not essential. The successful candidate will be expected to complement a flexible and innovative approach to the presentation of psychology as a relevant discipline to other professional groups.

Salary scale: £11,754 - £13,128 (per annum). Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

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Research and Studentships continued

The Hatfield Polytechnic School of Engineering

With support from the National Advisory Body the School of Engineering is expanding its already significant research programme and proposes to recruit staff in the following categories. The appointments are tenable for 3 years from 1 October 1985.

RESEARCH FELLOW Mechanical/Aeronautical Engineering in collaboration with British Aerospace

Applications are invited for a Post-Doctoral Research Fellowship in Composites. The successful candidate will join a team in the Division of Mechanical and Aeronautical Engineering carrying out collaborative work with British Aerospace into the Damage Tolerance Assessment of Carbon Fibre and Hybrid Composites. Candidates without a PhD will be considered if they have appropriate industrial and/or academic research experience. Initial Salary £11,634 inclusive of local weighting. Informal enquiries to Dr T H Brackell, telephone Hatfield (07072) 79251, from whom further details are available. Please quote reference 988 on application forms.

LECTURERS II In order to provide greater opportunities for existing staff to contribute to its research effort the Division of Electrical & Electronic Engineering is creating teaching posts at LI grades. Applications are invited from candidates with an interest and experience in Electronics, Telecommunications, Software Engineering or an allied topic. Salary is on the Lecturer II scale, (£7,812 - £12,363). Informal enquiries to Mr J F Alken, telephone Hatfield (07072) 79151, from whom further details are available. Please quote reference 989 on application forms.

Applications for all posts are available from the Staffing Office, The Hatfield Polytechnic, PO Box 108, Hatfield Herts or telephone (07072) 79802.

Further details and application forms from the Personnel Officer, Kingston Polytechnic, Penryn Road, Kingston upon Thames, Surrey KT1 2EE. Tel: 01-549 1366, Ext. 287. Closing date 1st August 1985.

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Further details and application forms from the Personnel Officer, Kingston Polytechnic, Pen

Property for Sale

By Direction of the South Staffordshire County Council
North Staffordshire

THE MADELEY COLLEGE OF EDUCATION

A FULLY EQUIPPED MODERN TEACHERS TRAINING COLLEGE

Close to M6 Motorway and convenient for many centres

5 Residential blocks of 75 rooms each. Main complex of lecture halls, dining hall, library, administrative offices, many lecture and tutorial rooms, conference suite, gymnasium and indoor pool complex. Common rooms, Chapel, Staff House and canteen.

IN ALL OVER 100,000 SQ. FT. ALL WITHIN EXTENSIVE LANDSCAPED CAMPUS OF ABOUT 35 ACRES

FOR SALE ON TO LET AS A WHOLE, BEING IDEAL FOR VARIOUS INSTITUTIONAL, COMMERCIAL, RESIDENTIAL, LEISURE, AND RECREATION PURPOSES (SUSJECT TO PLANNING CONSENT)

OFFERS ALSO CONSIDERED FOR DIVISION OF THE SITE FOR MIXED USAGE

All enquiries to (020908)

Cheshire, Gibson & Co. CHARTERED SURVEYORS
63, Temple Row, Birmingham B2 5LY
021-632 4292

Colleges and Departments of Art

ROYAL COLLEGE OF ART Hertfordshire College of Art & Design

STUDENTS

LEARN TO GRADE INDUSTRIAL MODEL MAKING

Hong Kong Baptist College

Director of Research and Statistics Branch

Salary £23,736 to £25,608
(inclusive of London Weighting
(salary range under review))

Following the appointment of Dr Peter Mortimore as Assistant Education Officer (Secondary Education), the Authority invites applications for appointment as Director of R&S Branch. The Director will manage a Branch of about 45 professional and administrative staff, with two main sections dealing with statistical data processing and research. The Branch is currently involved in a number of major research studies and it occupies a key position in monitoring and evaluating developments across the whole range of educational provision in inner London.

Candidates should be well qualified academically and have wide experience and a thorough knowledge of the education system. Experience in running educational research programmes and in computer/statistical work is essential. The efficient management of a multi-disciplinary staff will be required.

Suitable for job share

Application forms and further details are available from Personnel Services Division (EO/Eds) (R), Room 306, the County Hall, London SE1 7PB. Please enclose an SAE. Closing date for the return of completed applications is 13 August 1985.

ILEA IS AN EQUAL OPPORTUNITIES EMPLOYER (020609)

All advertisements are subject to the conditions of acceptance of Times Newspapers Ltd, copies of which are available on request.

Colleges and Institutes of Higher Education

College of St Mark & St John

ENGLISH Temporary L.II Post
(for Autumn 1985)
£7,548-£12,099

Applications are invited from suitably qualified persons for a one year temporary post teaching 19th-20th Century American Literature and Modern English Literature mainly in the BA Humanities (CNA).

Application forms and further particulars may be obtained from the Deputy Principal's Secretary (P.A.R.), College of St Mark and St John, Derriford Road, Plymouth PL6 8BH, Tel: Plymouth (0752) 771108, Ext. 220. Closing date 12th August.

(020612)

Hong Kong Baptist College

Applications are invited for the post of Lecturer in English Literature. The successful candidate will be responsible for teaching and supervising students in the Department of English Literature. The post is for a full-time basis and the salary is negotiable.

Overseas

KUWAIT University of Kuwait Health Science Centre Faculty of Medicine MEDICAL SCIENCE AND CLINICAL APPOINTMENTS

Applications are invited for the following appointments in the Faculty of Medicine:

- ANATOMY**
a. Assistant/Associate Professor in Gross Anatomy - 1 Post
Candidates should have teaching experience in Topographic Anatomy, General and Systemic Anatomy, and a research experience in any of the above fields. History, Development and Gross Anatomy.
- PSYCHIATRY**
a. Associate Professor - 1 Post
b. Assistant Professor - 1 Post
Candidates should have experience in teaching and/or research in clinical psychiatry, preference will be given to suitable candidates who speak Arabic.
- MEDICINE**
a. Associate/Full Professor in Dermatology - 1 Post
Candidates should have experience in teaching and/or research in dermatology, preference will be given to suitable candidates who speak Arabic.
- PAEDIATRICS**
a. Associate Professor in Paediatric endocrinology, Allergy or gastroenterology.
- PHYSIOLOGY**
a. Associate/Full Professor - 2 Posts
Preference will be given to general systemic physiologists with postgraduate experience in teaching and research.
- PHARMACOLOGY**
a. Associate/Full Professor in Toxicology - 1 Post
b. Associate Professor in Clinical Pharmacology - 1 Post
Candidates for the post of Toxicology should have experience in teaching and/or research in toxicology, preference will be given to suitable candidates who speak Arabic.
- SURGERY**
a. Professor ENT - 1 Post
b. Associate Professor ENT - 1 Post
c. Associate Professor in Anaesthesia - 1 Post
d. Associate Professor in Orthopaedic Surgery - 1 Post
Candidates for surgical posts should have at least 5 years' clinical and teaching experience. They should also possess a PhD or higher level research qualification (e.g. FRCS) in their respective fields.
- DIAGNOSTIC RADIOLOGY**
a. Professor - 1 Post
b. Associate Professor - 2 Posts
Candidates should have experience in teaching and/or research in diagnostic radiology, preference will be given to suitable candidates who speak Arabic.
- NUCLEAR MEDICINE**
a. Full Professor - 1 Post
b. Associate Professor - 2 Posts
Candidates should have experience in teaching and/or research in nuclear medicine, preference will be given to suitable candidates who speak Arabic.
- REQUIREMENTS FOR APPOINTMENT**
Applicants should be able to demonstrate teaching and research competence in their respective fields. The successful candidate is expected to take active part in undergraduate and postgraduate teaching, using lecture, tutorial and small group teaching techniques. He/she will be encouraged to follow his own line of research in addition to teaching duties. The Department, Faculty and Ministry staff in the design and conduct of research.
- CONDITIONS OF APPOINTMENT**
Applicants should be able to demonstrate teaching and research competence in their respective fields. The successful candidate is expected to take active part in undergraduate and postgraduate teaching, using lecture, tutorial and small group teaching techniques. He/she will be encouraged to follow his own line of research in addition to teaching duties. The Department, Faculty and Ministry staff in the design and conduct of research.

Applications are invited for the post of Chief Technician in the Departments of Surgery, Paediatrics, Community Medicine and Behavioural Science, Microbiology (Virology, and Immunology). Candidates should have experience as a clinical laboratory technician and hold the FIMLS, or equivalent qualification with 15 years' experience including training. The successful candidates' duties will be of a multi-discipline nature and will be both in laboratory and in the field.

Salary will be in the range KD450-512 per month, (KD1-£2.5, US\$3.2 approx.) There is no income tax in Kuwait and currency is transferable without restriction. Free furnished, air-conditioned accommodation is provided, and electricity and water supplied free of charge. Sixty days paid annual leave for each completed year of employment, and annual economy class return air tickets to the country of citizenship or permanent residence are provided for the appointee, spouse and three dependent children. Free medical treatment is available under the State Health Service.

Applications should be submitted to: The Director of Planning and Academic Staff Recruitment, Faculty of Medicine, University of Kuwait Health Science Centre, P.O. Box 24923 Safat, Kuwait, with detailed curriculum vitae in duplicate, recent passport photograph, and the name of three referees, to arrive not later than 30th October, 1985.

(020708)

KUWAIT University of Kuwait Health Science Centre Faculty of Medicine

Applications are invited for the posts of Chief Technician in the Departments of Surgery, Paediatrics, Community Medicine and Behavioural Science, Microbiology (Virology, and Immunology). Candidates should have experience as a clinical laboratory technician and hold the FIMLS, or equivalent qualification with 15 years' experience including training. The successful candidates' duties will be of a multi-discipline nature and will be both in laboratory and in the field.

Salary will be in the range KD450-512 per month, (KD1-£2.5, US\$3.2 approx.) There is no income tax in Kuwait and currency is transferable without restriction. Free furnished, air-conditioned accommodation is provided, and electricity and water supplied free of charge. Sixty days paid annual leave for each completed year of employment, and annual economy class return air tickets to the country of citizenship or permanent residence are provided for the appointee, spouse and three dependent children. Free medical treatment is available under the State Health Service.

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(020708)

Administration continued

University of Oxford ADMINISTRATIVE OFFICER

The work will involve a range of administrative and secretarial duties, including the preparation of reports, correspondence, and the management of the University's administrative services. The successful candidate will be responsible for the efficient running of the administrative services of the University.

Applications should be submitted to: The Director of Planning and Academic Staff Recruitment, Faculty of Medicine, University of Kuwait Health Science Centre, P.O. Box 24923 Safat, Kuwait, with detailed curriculum vitae in duplicate, recent passport photograph, and the name of three referees, to arrive not later than 30th October, 1985.

(020708)

Overseas continued

Lecturers and above

Egypt US \$31,800 tax free

Our client, a US based international company, is recruiting for its educational consulting project in Egypt.

A new growing academic technical institution is fast building a reputation for academic excellence and achievement.

They now require Lecturers to add their experience and contribute to the growth in stature of the institution.

They particularly need Lecturers for teaching posts and curriculum development in the following subjects:

- Aeronautical Engineering
- Computer Engineering (Electronics)
- Computer Science
- Mathematics
- Mechanical Engineering
- English as a Foreign Language

Unaccompanied status contracts are offered to candidates in the age range 28-35 years with approximately 5 years academic experience and a minimum of a Masters degree. Prior overseas experience and a PhD are preferred.

The excellent benefits include 4 weeks vacation, airfares to and from Egypt, furnished accommodation, full medical, transportation to and from work. The project is based in the affluent suburb of Heliopolis in Cairo.

Please send a detailed CV, quoting references 99/JF/85 to John Faith, Austin Knight Selection, 20 Soho Square, London W1A 1DS, England.

Austin Knight Selection

WAIT

Western Australian Institute of Technology

HEAD OF SCHOOL ECONOMICS AND FINANCE

Management and Economics stream is available in the Graduate Diploma in Business and the Master of Business programmes.

Applicants must possess a higher degree (preferably a doctorate) in economics, finance or related area. Previous teaching experience with industrial, commercial or professional experience and research and publications are desirable.

The Head will provide effective educational and professional leadership, co-ordinate academic and administrative operations and further the School's involvement with other educational institutions, business, industrial and professional bodies.

Salary: \$48,387 (Aust.).

Terms: The post offers permanent academic tenure and the appointee will have academic rank of Head of School level. The appointment is for an initial period of six years with eligibility for renewal. Should an appointee not continue as Head of School the academic level and salary are retained.

Conditions include terms for appointee and family plus assistance with removal expenses, superannuation.

Applications: Details including the names and addresses of three referees should be submitted not later than 18th August, 1985 to the Appointments Officer, Western Australian Institute of Technology, Kent Street, Bentley, Western Australia 6102. A brochure further information may be obtained by Telex (AA 5285) or Cable (WAITTECH) citing "Appointments", position reference number and your return address.

When applying please quote Ref. 799 HES.

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Western Australian Institute of Technology

Division of Business and Administration HEAD OF GRADUATE STUDIES

Management and Economics stream is available in the Graduate Diploma in Business and the Master of Business programmes.

The Head of Graduate Studies will be expected to co-operate with the Division's academic Heads of Schools and the Head of Undergraduate Studies to further the Division's involvement with business, industrial and professional bodies and other educational institutions.

Salary: \$48,387 (Aust.).

Terms: The post offers permanent academic tenure and the appointee will have academic rank of Head of School level. The appointment is for an initial period of six years with eligibility for renewal. Should an appointee not continue as Head of School the academic level and salary are retained.

Conditions include terms for appointee and family plus assistance with removal expenses, superannuation.

Applications: Details including the names and addresses of three referees should be submitted not later than 18th August, 1985 to the Appointments Officer, Western Australian Institute of Technology, Kent Street, Bentley, Western Australia 6102. A brochure further information may be obtained by Telex (AA 5285) or Cable (WAITTECH) citing "Appointments", position reference number and your return address.

When applying please quote Ref. 800 HES.

REMINDER

Copy for Classified Advertisements In the T.H.E.S.

should arrive not later than 10 a.m. Monday preceeding publication

Colleges and Departments of Art continued

West Surrey College of Art and Design Surrey County Council Foundation Studies

TEMPORARY LECTURESHIPS (GRADE II) IN DESIGN

(Two one-year half-time)

Two lecturers are required, one in Graphic Design and one in Fashion and Textiles Design, to assist in teaching practice and Foundation Course students.

If possible, appointments will be from September 1985.

Applicants for both posts should have good design qualifications and preference will be given to those who have experience of both design practice and teaching.

Application forms, which should be returned by 30th August, are available from the Registrar, West Surrey College of Art and Design, The Heath, Farnham, Surrey GU10 1HS.

UNIVERSITY OF ZULULAND SOUTH AFRICA ECONOMICS

Applications are invited from suitably qualified persons regardless of sex, religion, race, colour or national origin, for appointment on a three-year contract to the post of

PROFESSOR AND HEAD OF THE DEPARTMENT OF ECONOMICS

In the Faculty of Economic and Political Sciences. Salary in the range of R28,086-36,573 + 12% salary supplement. The commencing salary notch will depend on the applicant's qualifications and experience. In addition a service bonus is payable.

Application forms, further particulars of the post and information on pension, group insurance schemes, study aid for dependent children, leave conditions and travelling expenses on first appointment are obtainable from South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE.

Applications close 31st August 1985.

(020818)

KENYATTA UNIVERSITY COLLEGE OFFICE OF THE REGISTRAR

Applications are invited for the following posts:

1. PROFESSOR OF LITERATURE REF: KAC/85/22
Applicants should be holders of PhD degree or its equivalent in Literature, with considerable experience in university teaching and research supported with high quality publications.

Apart from providing academic leadership in the Department, the successful candidate will be required to teach at least two of the following: African Literature, European Literature, Oral Literature, Literature of the African Diaspora and Drama; supervise postgraduate students, as well as to take part in teaching practice.

2. PROFESSOR OF PHILOSOPHY & RELIGIOUS STUDIES REF: KAC/85/24
Applicants should have PhD degree or its equivalent in Religion. Considerable experience in teaching and research at university level supported with high quality publications are required for this post. Applicants may have as their areas of specialisation any of the following: Biblical Studies, Islamic Studies, Church History, Islamic and African Religion.

The successful candidate will be required to teach both at undergraduate and postgraduate levels, take part in teaching practice, conduct research and provide academic leadership in the discipline.

3. PROFESSOR OF EDUCATIONAL PSYCHOLOGY REF: KAC/85/25
Applicants should have PhD degree or its equivalent in Educational Psychology. They should also have considerable experience in teaching and research at university level, with an outstanding research output evidenced by high quality publications in their areas of specialisation.

The successful candidate will be required to teach both at undergraduate and postgraduate levels, supervise postgraduate students, take part in teaching practice, as well as to provide academic leadership in the Department.

4. PROFESSOR OF CHEMISTRY REF: KAC/85/26
Applicants should have PhD degree in Chemistry with long experience in university teaching and an outstanding record of research backed up by high quality publications in their areas of specialisation.

Applicants should be specialists in any of the major areas of Chemistry, namely: Physical, Organic or Inorganic. Ability to teach Chemical Physics or Quantum Chemistry will be an added advantage.

The successful applicant will be required to teach both undergraduate and postgraduate students, take part in teaching practice as well as carry out research in area of specialisation.

5. PROFESSOR OF EDUCATIONAL COMMUNICATION AND TECHNOLOGY REF: KAC/85/27
Applicants should be holders of PhD or EdD in fields related to Educational Communications and Technology. They should also have considerable experience in teaching and research in the field of Educational Communications and Technology at university level supported with high quality publications.

Applicants may offer one of the following as their areas of specialisation: Science and Mathematics, Social Studies, Language and Educational Technology.

The successful candidate will be required to teach both at undergraduate and postgraduate levels, participate in teaching practice, carry out research in areas of specialisation, as well as to provide academic leadership in the Department.

6. ASSOCIATE PROFESSOR IN LITERATURE REF: KAC/85/28
Applicants should be holders of PhD degree or its equivalent in Literature with extensive experience in university teaching and research supported with high quality publications.

The successful candidate will be required to teach at least two of the following areas: African Literature, Theory of Literature and Stylistics, Oral Literature, European Literature, Literature of the African Diaspora and Drama; supervise postgraduate students as well as take part in teaching practice.

7. ASSOCIATE PROFESSOR IN PHILOSOPHY REF: KAC/85/29
Applicants should have PhD degree or its equivalent in Philosophy. They should also have considerable experience in teaching and research at university level, with an outstanding research output evidenced by high quality publications in their areas of specialisation.

The successful candidate will be required to teach both at undergraduate and postgraduate levels, take part in teaching practice, as well as to conduct research in area of specialisation.

8. SENIOR LECTURER IN EDUCATIONAL PSYCHOLOGY REF: KAC/85/30
Applicants should have PhD degree or its equivalent in Educational Psychology. Preference will be given to those with two or more years of teaching experience at university level.

The successful candidate will be expected to teach Educational Psychology courses to both undergraduate and postgraduate students, as well as to supervise students working for MA and PhD degrees by thesis.

9. SENIOR LECTURERS IN TAXONOMY (REF: KAC/85/31)
The successful candidate will be required to teach at least two of the following areas: Taxonomy for the first post, or in terrestrial or aquatic ecology; for the second post, Studies for an initial period of up to six years, it may thereafter be extended or renewed on the basis of the Division's academic standards and research in the postgraduate teaching, research and administration.

Salary: \$48,387 (Aust.).

Terms: The post offers permanent academic tenure and the appointee will have academic rank of Head of School level. The appointment is for an initial period of six years with eligibility for renewal. Should an appointee not continue as Head of School the academic level and salary are retained.

Conditions include terms for appointee and family plus assistance with removal expenses, superannuation.

Applications: Details including the names and addresses of three referees should be submitted not later than 18th August, 1985 to the Appointments Officer, Western Australian Institute of Technology, Kent Street, Bentley, Western Australia 6102. A brochure further information may be obtained by Telex (AA 5285) or Cable (WAITTECH) citing "Appointments", position reference number and your return address.

When applying please quote Ref. 800 HES.

10. SENIOR LECTURER IN EDUCATIONAL COMMUNICATION AND TECHNOLOGY REF: KAC/85/33
Applicants should be holders of PhD or EdD in fields related to Educational Communications and Technology with specialisation and experience in one of the following areas: Science (including Mathematics), Language Arts, Social Sciences (History, Geography or Religious Education), Creative Arts or Educational Technology. Outstanding research record supported by publications in reputable journals will be required for the post.

The successful applicant will be required to teach both at undergraduate and postgraduate levels, take part in teaching practice as well as to conduct research in area of specialisation.

11. SENIOR LECTURER IN PHYSICAL EDUCATION REF: KAC/85/34
Applicants should be holders of PhD in Physical Education or Sports, with teaching experience at university level.

Candidates with Masters degrees and several years of teaching experience at university with some good publications to their credit, will also be considered.

The successful candidate will be required to teach both at undergraduate and postgraduate levels, take part in teaching practice, as well as to conduct research in area of specialisation.

12. ASSOCIATE PROFESSOR IN PHILOSOPHY REF: KAC/85/35
Applicants should have PhD degree or its equivalent in Philosophy, with considerable experience in university teaching and research supported with high quality publications.

Applicants may offer one of the following as their areas of specialisation: Epistemology, Ethics, Aesthetics and Political Philosophy, and Philosophy on Religion. Successful candidate will be required to teach both at undergraduate and postgraduate levels, participate in teaching practice, carry out research in areas of specialisation.

Terms of service for all the above posts include membership of Senior Staff Superannuation Fund or FSOB and a non-contributory medical scheme, subsidised housing and/or a generous housing allowance.

Applications (6 copies) giving full details of age, marital status, educational qualifications, experience, present post, salary, copies of curriculum vitae, names and addresses of three academic referees should be addressed to: The Registrar, Kenyatta University College, P.O. Box 43944, Nairobi.

Salary Scales:
Professor: KES 540 x KES 180 - KES 200 per annum.
Associate Professor: KES 450 x KES 150 - KES 180 per annum.
Senior Lecturer: KES 350 x KES 150 - KES 400 per annum.
Closing date: 31st August, 1985.

(020409)